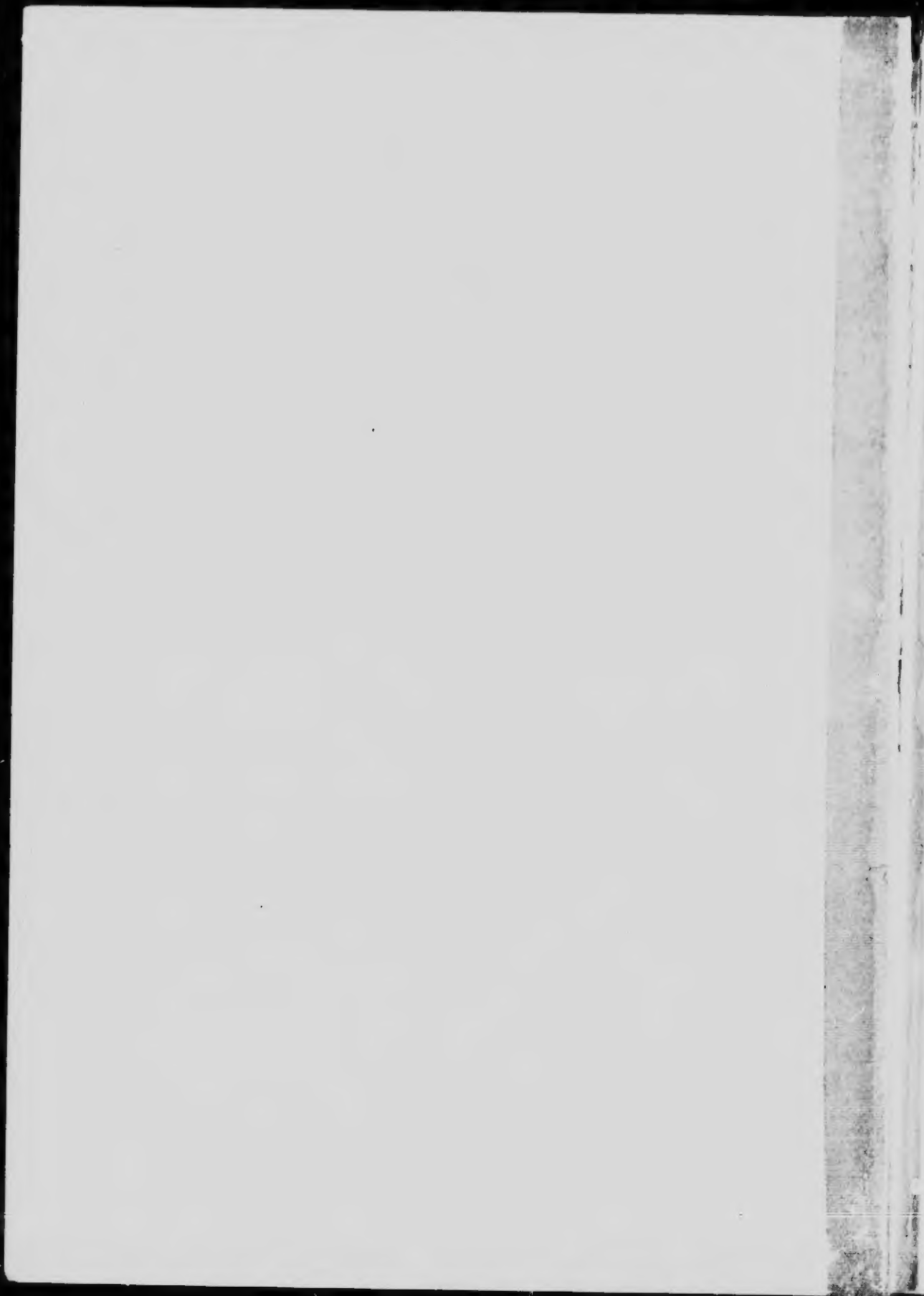
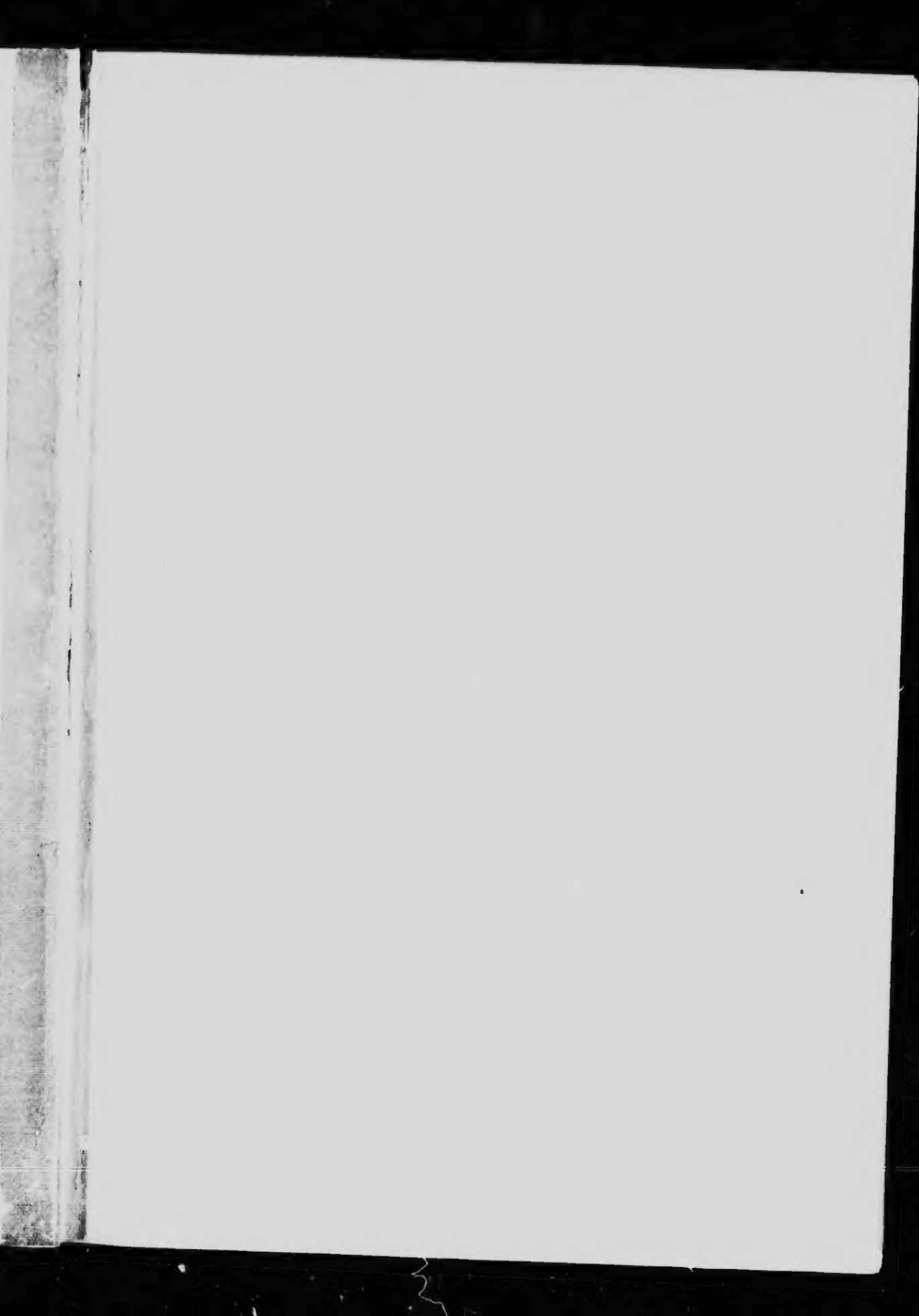


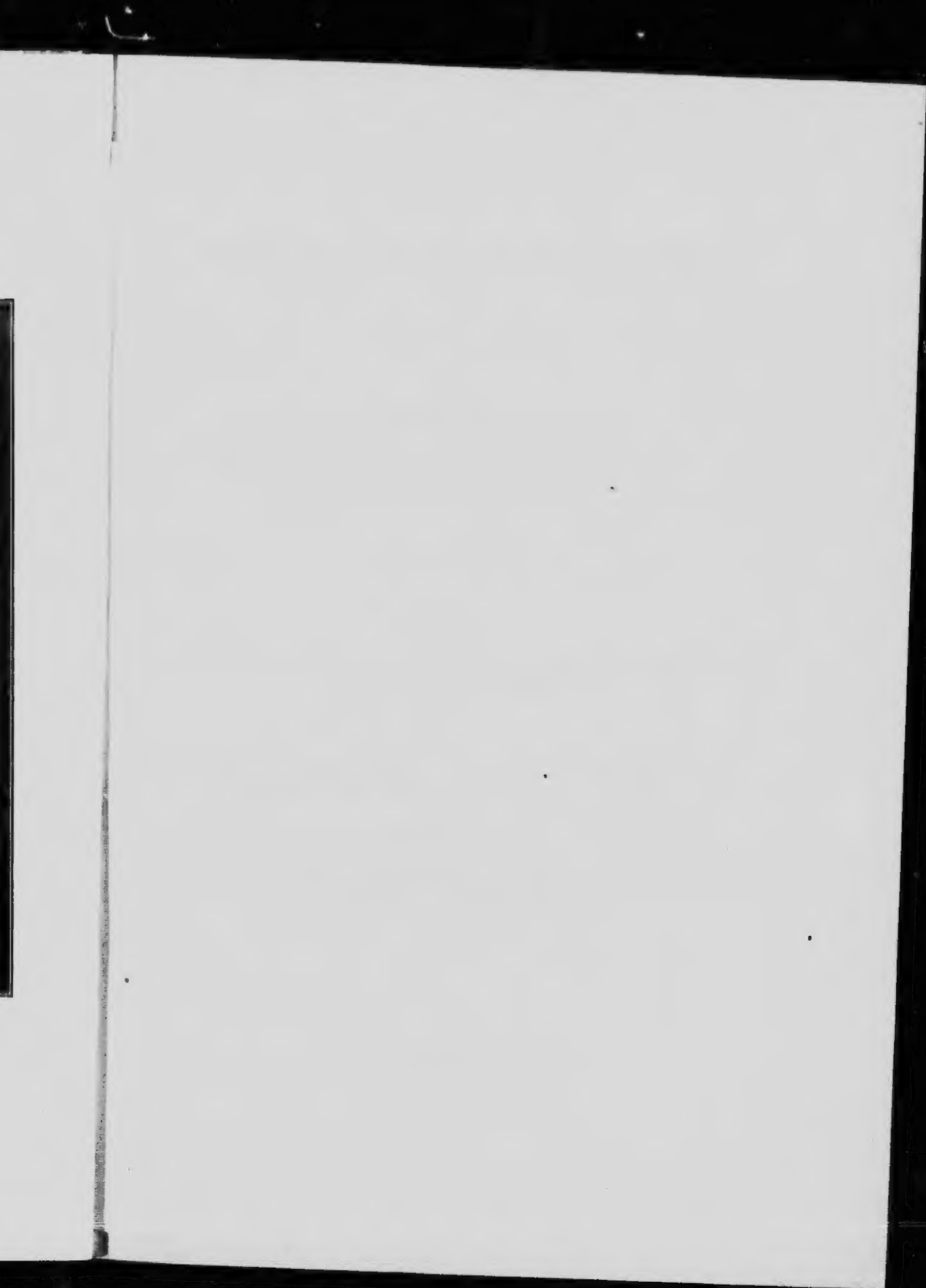
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THE AUTHOR.





THE CANADIAN APPLE GROWER'S GUIDE

BY

LINUS WOOLVERTON, M.A.

Author of "Fruits of Ontario"; Editor of "The Canadian Horticulturist" and Secretary of the Ontario Fruit Growers' Association, 1886-1903; Inspector of the Ontario Fruit Experimental Stations and Secretary of the Board of Control, 1896-1906; Judge in Pomology and Superintendent of Horticulture for the Dominion of Canada at the World's Columbian Exposition, Chicago, 1893; etc.

PART I.

A Complete Guide to the Planting, Culture, Harvesting
and Marketing of Apples.

PART II.

Apples of Canada carefully Described and Illustrated from
Specimens of the Varieties Grown in the Dominion.

PART III.

Varieties of Apples Recommended for Planting in the Various
Apple Districts of the Dominion.

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WILLIAM BRIGGS
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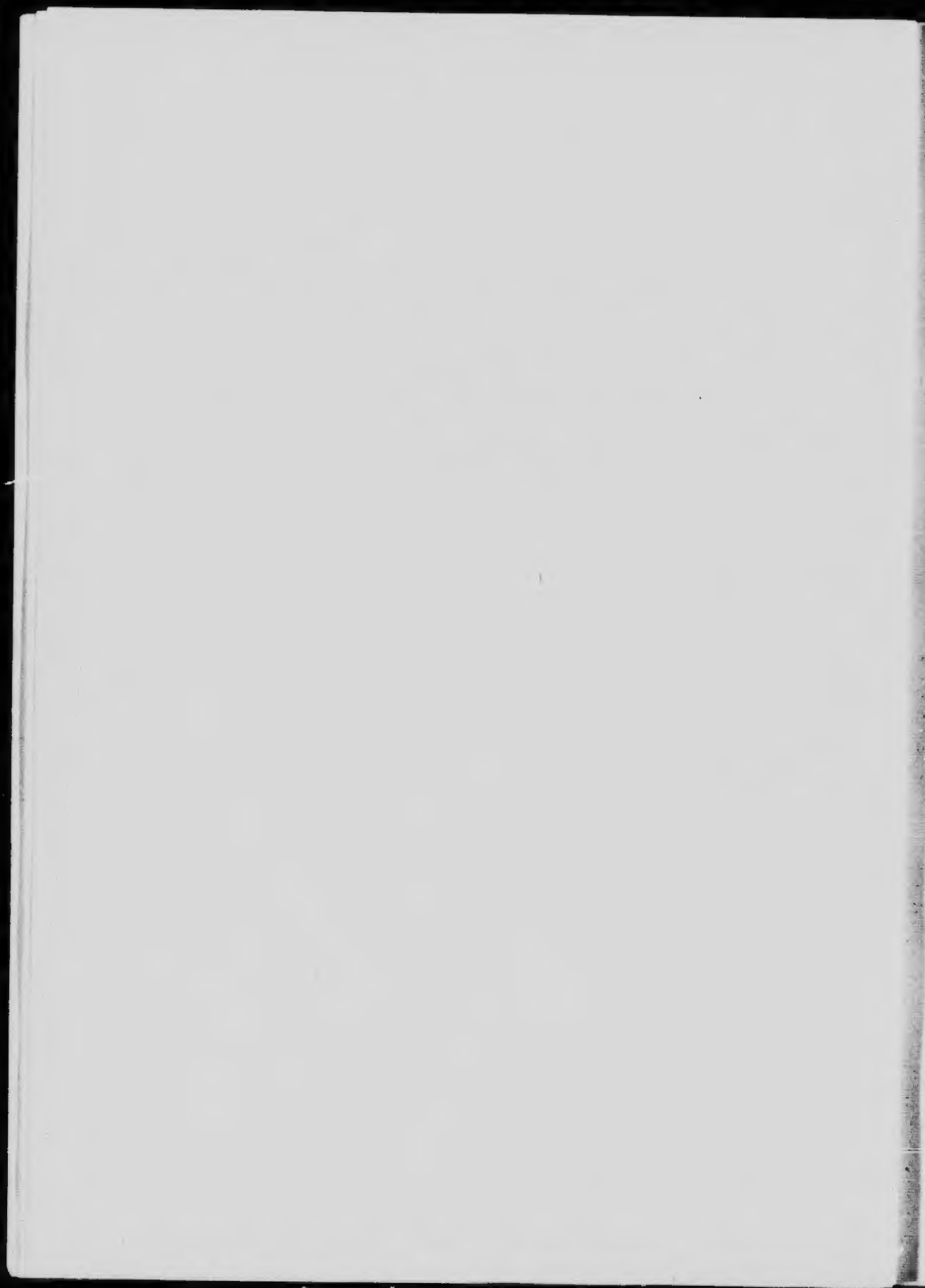
DEDICATED

TO

THE MEMORY OF MY FATHER,

Charles Edward Woolnerton,

ONE OF THE FEW CONSTITUENT MEMBERS OF THE
ONTARIO FRUIT GROWERS' ASSOCIATION
WHEN IT WAS FORMED IN 1859.



PREFACE.

Having had fifty years of practical experience in apple growing on what was for many years the largest fruit farm in Canada; and having had under test about one thousand varieties of fruits, both for private study and for experimental work under the direction of the Department of Agriculture for Ontario; and further, having made both the practical and the theoretical sides of fruit culture a life study, I esteem it a duty to write down as a guide to the novice those things which I have learned; and I trust that, notwithstanding the many publications upon the subject, this one, being especially adapted to conditions in Canada, may prove to be of permanent value to the apple growers of Canada and of the northern United States.

LINUS WOOLVERTON.



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PART I.

**A COMPLETE GUIDE TO THE PLANTING,
CULTURE, HARVESTING AND
MARKETING OF APPLES.**







FIG. 1.—THE WOOLVERTON ORCHARDS, IN THE NIAGARA DISTRICT, WITH LAKE ONTARIO IN THE BACKGROUND.

Photo by Mr. Royce of Fruit Department Ontario.

THE Canadian Apple Grower's Guide.

PART I. A COMPLETE GUIDE TO THE PLANTING, CULTURE, HARVESTING AND MARKETING OF APPLES.

CHAPTER I. INTRODUCTORY.

This king of fruits, the apple, is grown over a large part of the Dominion. It is grown profitably for export in parts of Nova Scotia, Quebec and British Columbia, and throughout all the older settled portions of the Province of Ontario, and to a limited extent for home uses in certain sections of the other provinces. Of the crop of 1907 there were exported from Canada 1,629,130 barrels of apples, which number, however, represents but a small proportion of the whole quantity grown.

In Nova Scotia, Quebec and Ontario apple growing was undertaken at an early date, first by the early French settlers, and later by the U. E. Loyalists who came into Canada soon after the Treaty of 1783. In the latter province some of the first orchards were planted in the old Niagara District, between the Niagara River and Hamilton, of which, even now, some trees remain and produce paying crops. One of these old landmarks, an immense Greening apple tree, still stands on the old Woolverton homestead near Grimsby, and its huge spreading top covers an area of ground more than 40 feet in diameter. This tree has been known to yield twenty barrels of marketable apples in a single season!

Starr records the names of many Loyalists who planted apple orchards in Nova Scotia, but gives credit to Hon. C. R. Prescott for planting the first very large one, near Starr's Point, Cornwallis County, in 1812. His list included some eighty

varieties—importations from Massachusetts, from England and from France; and his success was the incentive to other planters.

Owing to the convenience of situation for shipping by water, many parts of Ontario, Quebec and Nova Scotia were able to begin the export of winter apples long before our railways were in operation, but of course this often necessitated long hauls on wagons to bring them into the seaport. In Nova Scotia, for example, Starr says that in those early days apples were trucked over rough roads sixty or seventy miles to Halifax; or else closed in the holds of small schooners, with potatoes and other vegetables, and sent on an eight to fourteen days' trip around the coast to the same destination. About 1853 a railroad was built from Halifax to Truro and Windsor, enabling the schooners to load at such points as Wolfville, Starr's Point, Port Williams, Canard and Kingsport, and sailing up the Avon at flood-tide, to unload at Windsor on cars for Halifax.

Since that time a perfect network of railways has been extended throughout the interior parts of all the apple growing provinces of Canada so that cars may be loaded at convenient points either for ocean ports or for North-West markets, thus giving the business of commercial apple growing a wonderful encouragement.

To give some idea of the relative importance of the apple industry throughout the entire Dominion we quote the following estimate of the yields in the various provinces taken from the decennial census of 1901, since which time there have been large increases:

Ontario	12,645,420	bushels
Nova Scotia	1,978,735	"
Quebec	1,896,229	"
New Brunswick	490,434	"
British Columbia	221,294	"
Prince Edward Island	155,630	"
The Territories	1,487	"
Manitoba	555	"

To show still more clearly the important place taken by Canada among the apple producing countries of the world, we give the following interesting table, which shows that in 1907

nearly one-half of all the apples imported into Great Britain from all sources, came from our Dominion:

ANNUAL STATEMENT OF THE APPLE TRADE OF THE
UNITED KINGDOM.

Apples.	1903.	1904.	1905.	1906.	1907.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
From—					
Germany	20,738	5,264	5,198	19,545	5,152
Netherlands	49,086	20,541	49,317	23,645	34,009
Belgium	112,688	171,407	46,775	46,967	66,259
France	48,976	45,151	107,745	21,250	21,630
Portugal	203,400	126,566	100,708	108,302	68,657
Spain	10,110	1,267	63,614	11,060	40,266
United States of America ..	2,381,619	1,850,037	1,631,819	1,407,645	1,413,231
Other foreign countries	1,711	701	252	231	429
Total from foreign countries ..	28,328	2,220,934	2,005,428	1,638,645	1,649,633
From—					
Channel Islands	9,861	8,438	20,713	13,548	7,582
Australia—					
Western Australia .....	.....	.....	.....	62	491
South Australia (including					
Northern Territory)....	11,842	31,664	24,228	18,841	9,079
Victoria	29,373	22,650	23,018	20,783	40,523
New South Wales .....	.....	2,278	176	270	709
Tasmania	144,678	277,367	173,284	117,577	229,331
Canada	1,545,455	1,208,409	1,247,766	998,937	1,588,603
Other British possessions	9	41	47	69	281
Total from British possessions ..	1,741,218	1,550,847	1,489,232	1,170,087	1,876,599
Total	4,569,546	3,771,781	3,494,660	2,808,732	3,526,232

The export apple trade for the season of 1907-8 was the greatest on record, the exports for the year ending March 31 amounting to 1,629,400 barrels, valued at \$4,823,645. The season of 1903-4 had been the leader previously, but now in second place as the following figures show:

Year ended March 31st.	Brls.	Value.
1904	1,577,285	\$4,529,500
1905	997,488	2,551,474
1906	1,280,789	4,217,704
1907	998,618	2,702,623
1908	1,629,400	4,823,645
1909	1,092,090	2,804,282



FIG. 2.—AN APPLE ORCHARD 75 MILES BELOW QUÉBEC CITY.
(Cut from Report of Dairy and Cold Storage Commissioner, Ottawa, 1909.)

Owing to the partial failure of the apple crop in many portions of the United States a very considerable quantity of the early apples grown in Ontario were shipped to Chicago and other western cities, and on account of this movement the shipments of early apples to Great Britain were less than would otherwise have been the case.

The bulk of the apples exported was shipped through the following ports:

Montreal, to end of November.....	614,110 barrels
Halifax, to end of March	367,175 "
Portland, to end of March.....	271,111 "
St. John, N.B., to end of March.....	71,079 "

The balance of the exports went by way of Boston and New York.

The apple growing Provinces.—The Province of Quebec, being one of the oldest parts of the Dominion, has long been engaged, more or less, in apple growing, especially in the Ottawa District, including the Ottawa Valley south of latitude 46 deg.; and in the Montreal District, extending from Montreal to Rimouski.

From the vicinity of Montreal we get the finest dessert apple in the world, the famous Snow apple, or Fameuse as the French call it.

For their efforts in introducing hardy varieties the apple growers of Quebec are much indebted to the late Chas. Gibb, of Abbotsford; and to the work of the Quebec Pomological Society, of the Fruit Experiment Stations of Quebec, and of the Central Experimental Farm at Ottawa.

In the Province of Ontario there were estimated to be in 1901 about 228,000 acres of apple orchard, containing about nine and a half million apple trees, two-thirds of which were not yet in bearing, and yielding over four million barrels of apples, the capital thus invested amounting to over thirty million dollars. These estimates are far short of the yields of the five years succeeding 1901, during which time the average yield of the apple orchards of the Province of Ontario had been estimated at over ten million barrels!

In Nova Scotia the area devoted to successful apple growing is mostly limited to the celebrated Annapolis Valley. This

is really a continuation of the valleys of Annapolis, Cornwall, Gaspereau and Windsor; a territory about one hundred miles in length, and varying from six to ten miles in width. It is protected by parallel ranges of mountains known as the North and South Mountains. The census of 1901 gives the number of acres in orchard and garden as being over 32,000. The rapid growth of the apple industry in this district may be imagined when we compare the total export of apples in 1880-1, viz., 41,735 barrels, with that of the season of 1907-8 when it was estimated at 750,000 barrels!

In British Columbia, in valleys between great mountains and lying along small lakes, rivers and creeks are found sections of very fertile land, favored with mild, dry climate and plenty of sunshine, where, by the aid of irrigation, apples of large size and high color are produced, which are very little affected with scab or codling moth. Here some of the old English varieties, Newtown Pippin, Cox's Orange, Spitzenberg, etc., are grown to perfection. In the Okanagan Valley of this province is to be found the largest apple orchard in the Dominion. It is known as the Cold Stream Orchard, and is owned by a company of which Lord Aberdeen, at one time Governor-General of Canada, is the principal shareholder. This orchard is 400 acres in extent, and the average output is about fifty car-loads, or about thirty thousand boxes of apples.

Throughout the "Dry Belt" of British Columbia the importance of applying water artificially cannot be over-estimated, for without it regular crops of fine apples cannot be assured. J. R. Anderson says, however, that "there is as great danger attending an over-supply of water as there is an insufficiency. Water should never be applied after the fruit has attained its full size, or there will be danger of injury to the fruit, impairing its keeping qualities so materially as to render it unfit for transportation. Another evil of irrigation, after the wood has attained its maturity, is the promoting of a second growth, so that the wood is in an unripe state, and the tree liable to break down or split apart. As a matter of fact, a very small quantity of water, judiciously applied, succeeded by cultivation, is far better than an over-supply—so beware of using too much water. Cultivation is often all that is necessary, and when water is applied, use it intelligently."

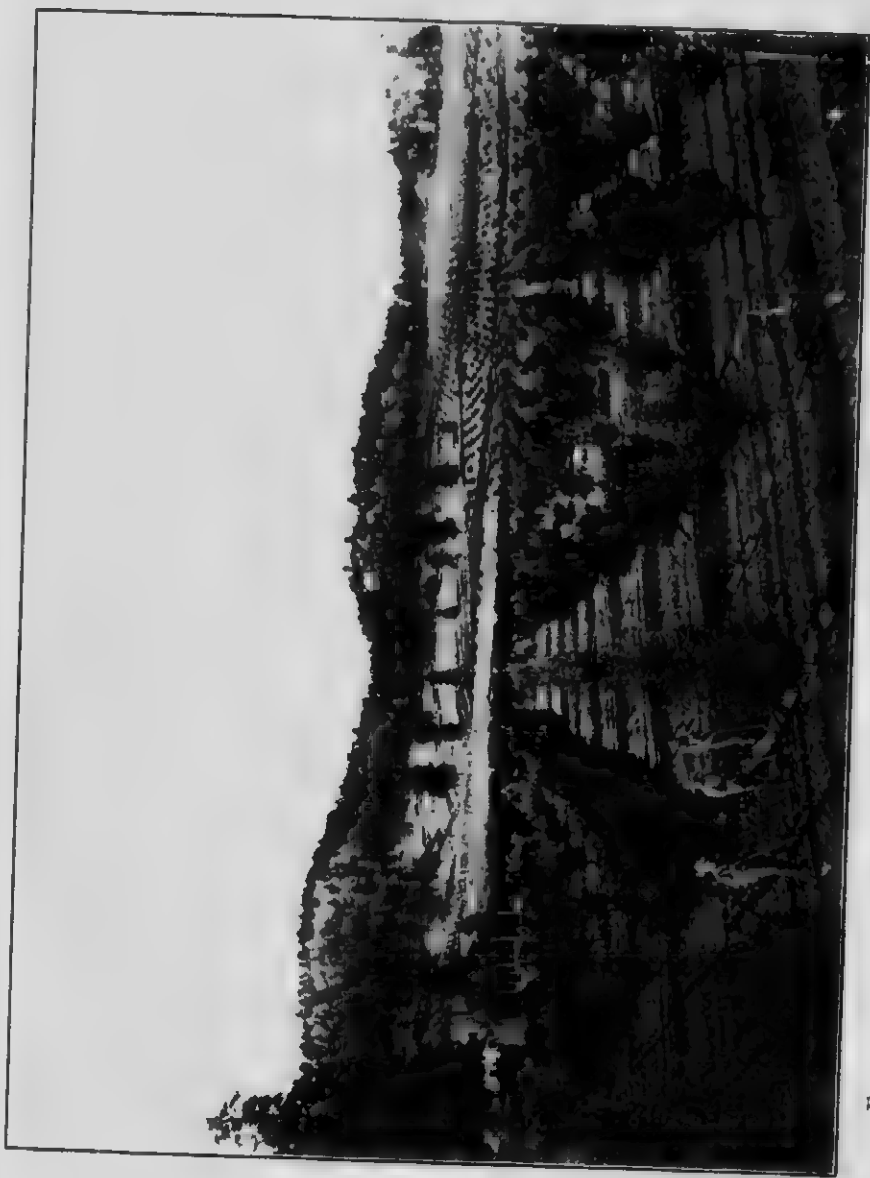


FIG. 3.—A FOUR-YEAR-OLD PEACH AND APPLE FARM IN THE PRAIRIE VALLEY, BRITISH COLUMBIA, SHOWING FURROWS FOR IRRIGATION.

Palmer gives the following estimate of the cost of setting out an orchard of twenty acres in British Columbia:

Twenty acres (irrigated) at \$150 per acre . . .	\$3,000 00
Fencing	200 00
Preparing land	150 00
Trees (968) at 25c. each	242 00
Freight	20 00
Setting out trees at 8c. each	77 44
	<hr/>
	\$3,689 44

In what may be called "The South-western Coast District" conditions are different, and the mild climate and the excessive moisture in winter tend to favor the prevalence of fungous diseases. This district is, therefore, better adapted to the growing of small fruits than of apples.

With regard to the Province of Saskatchewan we learn from the Department of Agriculture, Regina, that "no definite information can be given as to localities most suitable for apple growing, except that the southern portion of the province needs shelter belts before any success can be obtained," and that "on the Experimental Farm at Indian Head they are growing a number of crabs and trying to work up something from *Pyrus baccata*."

The Superintendent of Fruit Experimental Stations for Alberta writes that "fruit growers have been successful in maturing apples at Medicine Hat, Lethbridge, Magrath, Cowley, Red Deer, and even as far north as Edmonton and Fort Vermilion in the Peace River Country." Nine fruit experiment stations were started by the Department of Agriculture in 1907; but only the hardiest varieties are being tried so far, such as Hibernial, Charlamoff, Wealthy, Duchess and Patten's Greening.

CHAPTER II.

THE OUTLOOK FOR APPLE GROWING IN CANADA.

In the opinion of the writer the outlook before the Canadian apple grower grows brighter year after year. It is true that there are numerous discouragements, such as the many years of waiting before an orchard comes into full bearing, the prevalence of codling moth and apple scab, and the low prices which sometimes prevail. At the same time, where the best methods of culture are employed, the most profitable varieties grown and the best methods of marketing followed out, a thrifty apple orchard in full bearing in the apple belt of Nova Scotia, Ontario or British Columbia is often the best paying branch of agriculture, and is valued at prices varying from \$500 to \$1,000 an acre.

The apple is the staple fruit commodity in all markets of the world; it can be stored during the round year and shipped out as the market demands it; it can be transported long distances by freight at reasonable rates; and even the refuse may be manufactured into many useful products.

True, the price of apples varies widely from year to year, and there will be seasons of over-production, as, for example, that of 1896, when it seemed that all apple-producing countries combined in yielding a bumper crop, and prices consequently dropped below the margin of profit; but such a coincidence seldom occurs, for usually the surplus of one country simply makes up for the shortage of another.

Indeed, the prices obtained for this fruit are as good in this twentieth century as they were in the nineteenth, if not better. In the decade between 1860 and 1870 we thought it a high price in Ontario, if we were offered \$2.50 per barrel, f.o.b., for our No. 1 winter apples; and now, in the first decade of the twentieth century, No. 2 apples have sold at \$2.00, No. 1 at \$3.00 per barrel, and fancy stock in boxes as high as \$2.00 a bushel! Nor are these prices obtained in Ontario alone, but also by growers in Quebec, Nova Scotia and British Columbia. In the latter province, during the season of 1905-6 No. 1 apples in boxes at shipping points brought an average of \$1.27; in 1906-7, early apples averaged from \$1.00 to \$1.50; fall apples, \$1.25, and winter \$1.70; and in 1907-8 from 60c. to \$2.00 a box.

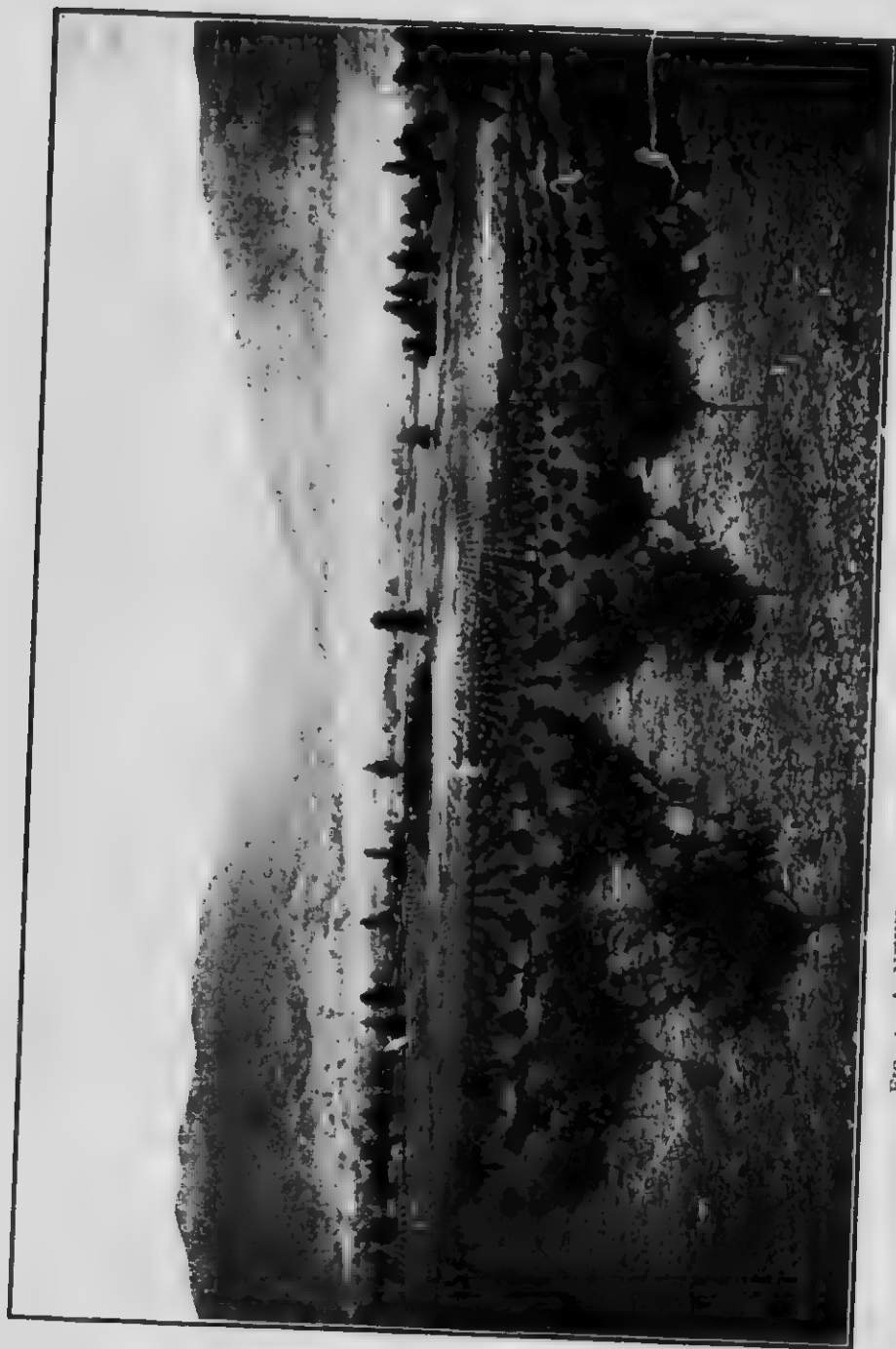


FIG. 4.—A NEWLY-PLANTED BRITISH COLUMBIA APPLE ORCHARD.
(Favor of R. M. Palmer, Department of Agriculture, Victoria, B.C.)

Judging from the upward tendency in prices, and from the fact that in some parts the apple orchard is being uprooted or neglected, and that the planting of apple trees is by no means commensurate with the increase of the world's population, we are inclined to believe that there is some ground for predicting an apple shortage before very many decades have passed.

And when we consider not only the great foreign markets to which we now have access, but also our own great North-West, which will draw more heavily every year upon the apple districts of the Dominion for their supply of this staple fruit, we need have no fears about the ultimate profits to be derived from a well-cared-for apple orchard of the best varieties, set anywhere in the favored apple sections of our Dominion.

Importance of location.—The beginner in fruit growing for profit should choose his location with a view to the fruit which he intends to make his specialty, or else, being located, he should grow those fruits adapted to his location. While apples may be grown with profit over a large extent of territory, yet, in some parts, they should be the last to be considered because of local reasons; as, for example, the bulkiness of the crop which makes it too expensive to haul a long distance to a shipping point, or the price of land which may be too high for planting with apples. With ten or fifteen years to wait before an apple orchard comes into bearing, the apple tree planter should not pay too much for land. In the Niagara Peninsula, in Ontario, for example, much of the land is too valuable for apple growing: the soil and the climate here combine to make certain portions suitable for peach growing, a much higher priced product. Such select portions should not be purchased with a view to planting with apples, as indeed many fruit growers have lately found out to their cost; for, after an expenditure of years of time and much money raising an apple orchard to an age of fruit bearing, they are now at the additional expense of digging out these large trees to clear the land and prepare it for peach raising. A other point to be considered in locating is the proximity of others engaged in the same business. A community of apple growers gain much by working in co-operation, in the way of shipping accommodation, freight rates, purchase of supplies, attention of buyers and in other ways too numerous to mention.

CHAPTER III.

BUYING A FARM FOR APPLE GROWING.

In view of the great number of buyers looking for fruit farms already in bearing, many of them novices in any line of fruit growing or even of ordinary agriculture, a few hints on this point may be opportune. Some common mistakes are as follows:

1. Buying too many acres.—It is a common delusion to think that if one acre in fruit yields a gross income of \$100, ten acres must yield \$1,000, and one hundred acres \$10,000. Possibly so, if the man could manage one hundred acres as he could one acre, and had, at the same time, proportionate capital. But usually, the greater the acreage the less the net profit per acre. Why? Because there is more waste, poorer cultivation, greater neglect of pruning, manuring, thinning and spraying, and more loss of fruit in the harvesting. Ordinarily it would be wiser for the novice to buy a twenty-five-acre farm than a fifty; indeed, one-half the fruit farmers in Canada would make more money out of their investment if they owned less land and devoted proportionately greater attention and money to its management.

2. Choosing a farm ill-adapted to fruit growing.—A novice recently purchased fifty acres of land that appeared to him to be suitable for orchard planting. The soil was good, it was located near a railway station, and in the vicinity of other fruit growers, but after the purchase he found that nearly the whole place must be thoroughly tile drained before planting. This was difficult because there was no good fall for the water; and, with the high price of expert labor, a thorough system of drainage almost equalled the whole first cost of the farm.

3. Locating too far away from shipping points or buying centres.—At first thought one would scarcely realize that land for orcharding depreciates in value inversely to the number of miles distant from such points. A young man, a Canadian, well equipped for success in other respects bought a fruit farm many miles distant from an express office, post-office or railway station. The carrying of his fruit to the shipping point, the extra horses, and wear and tear resultant, and the loss

of his time in going back and forth amounted in the year to a sum about equal to the interest at 6 per cent. on the whole amount of his purchase. After nine years, this tax of distance, over a badly kept road, so counted against his yearly balance in hand, that the young man wisely sold his farm and sought a new location.

4. Buying a fruit farm planted with undesirable varieties.—A mistake of this kind is very natural and very frequent in the purchase of a fruit farm. The novice simply counts up the number of acres in orchard as placed before him by the owner, or by the land agent; or, if inclined to be a little cautious, he takes count of the number of trees in bearing and bases his idea of value accordingly. Not knowing much about the productiveness or the sale value of varieties, it is no wonder that such a buyer is often disappointed when he comes to the time of reckoning his annual profits.

5. The condition of the land, especially with respect to fertility, is too often overlooked.—If it has been allowed to run down and become impoverished, it may take two or three years of expensive treatment to restore its fertility.

6. The condition of the trees themselves, too, is a very important consideration, for if stunted, covered with bark lice, barked in ploughing, badly pruned, girdled by mice, or otherwise neglected, great depreciation of value must be allowed.

All these factors should be taken into careful consideration before purchasing a fruit farm; and, if the buyer is not sufficiently posted to judge for himself, he should consult with some experienced fruit grower whose advice could be relied upon.

It would be judicious, before purchasing, to require a statement of the previous year's expenses and receipts in detail, or, if possible, a five years' average, which would materially assist in arriving at a fair valuation. Of course, in making an estimate of the annual profits, money spent in permanent improvements, such as tree planting, draining, fencing, buildings or machinery, should be omitted, because they belong to capital account.

CHAPTER IV.

CHOOSING VARIETIES FOR THE APPLE ORCHARD.

Adaptation.—Having located his fruit farm, the apple grower needs first to make a special study of the varieties best adapted to the local conditions.

Generally speaking, the more southern portions of the Province of Ontario are well adapted for raising early apples, such as Astracan, Duchess, Alexander and Gravenstein, which may often be profitably boxed and exported in cold storage; while, in the middle portions, the winter kinds, such as Baldwin, Greening, Spy and Russet, attain a higher color, are firmer in texture and later in ripening.

For special dessert apples, such as Fameuse and McIntosh the colder parts as far north as Montreal and Ottawa seem well adapted to give that color and crisp flesh which make them so desirable.

In Nova Scotia the Gravenstein is a leading apple for profit, for, as there grown, it is unexcelled by any apple of its season for either export or home uses, and to it the fame of the Annapolis Valley, as an apple growing country, is largely due. The valleys of British Columbia, again, present conditions favorable for growing some famous British apples which are a comparative failure in Ontario, such as Cox's Orange Pippin, Blenheim and Ribston.

Making up a list.—Before beginning to make up a list of varieties for planting in a given section, the apple grower should consider his markets. If situated at some distance from a shipping point, he cannot afford to grow many small lots of different summer varieties to cart away to market in succession; but, if near a point where iced cars are being shipped during the summer to cold storage steamers for the export of fruit, he may plant freely of summer and early fall varieties. Or again, if near a large apple storage house, where packing and shipping is in progress throughout the whole winter, he may plant a large orchard of winter apples with confidence.

A word of warning is here in place against selecting too many varieties. At the Cold Stream Ranch in British Columbia some fifty varieties were planted at first. Now this is an evident mistake, and a large number of them are being top grafted over to one variety, the Cox's Orange. The same mistake has been made in every province. The old apple orchard on the writer's



FIG. 5.—PICKING GRAVENSTEINS IN NOVA SCOTIA.

(Report of Dairy Commissioner, Ottawa, 1908.)

fruit farm consisted of over forty varieties, very useful in taking the prize at Fairs for the largest collection of varieties, but a nuisance when selling the crop. Buyers object not only to more than one kind in a barrel, but also to car lots of many kinds. A straight car lot of a single known variety, which has an established reputation, is much preferred by a dealer, and will, as a rule, bring the grower a better price than mixed lots.

Of course, private orders will often require a list of varieties, ripening in succession during the winter, and this also is to be considered in planting, and varieties so selected as to cover the season, and planted in blocks convenient for gathering one kind at a time.

On the other hand, there is danger in planting too large a block of any one variety without an occasional row of some other kind. Nature insists on cross fertilization, and seems to produce better fruit where the flowers of one variety are fertilized by the bees bringing it the pollen from another. A large Baldwin orchard near Hamilton, Ontario, for example, was for many years a puzzle to pomologists, for, while usually the most productive variety, yet this orchard, though of full bearing age, for many years gave no crop. If one or two rows of Greenings had been planted, or some other variety rich in pollen, blooming at the same time, no doubt the result would have been more satisfactory.

Botanically speaking, the flowers of the apple are self-fertile, or monœcious, that is, they have both the male and female organs, viz., the stamens and the pistil, fully developed on each individual. but, owing to the effects of high cultivation and cross fertilization employed in producing new and choice varieties, many seem to have become to a certain extent self-sterile. Among these apparently should be named Blenheim, Gravenstein, Bellflower, Spy, King, McIntosh, Astracan, Spitzenberg, Roxbury, and some others. Among the varieties usually self-fertile may be named Duchess, Wealthy, Snow, Transparent, Wagener, Stark, Ontario and Greening.

For lists of varieties of apples adapted to the various fruit districts, the reader is referred to Part III. of this work, which should be of great value in making up the list for his orchard.

CHAPTER V.

PLANTING AN APPLE ORCHARD.

Ordering trees.—After selecting with great care the varieties of apples best adapted for planting in the locality in which one is situated, it is important to buy from a nursery which has similar conditions of climate and soil. Trees grown too far to the south make a growth which is too succulent and immature to bear the sudden transition to a very much colder section.

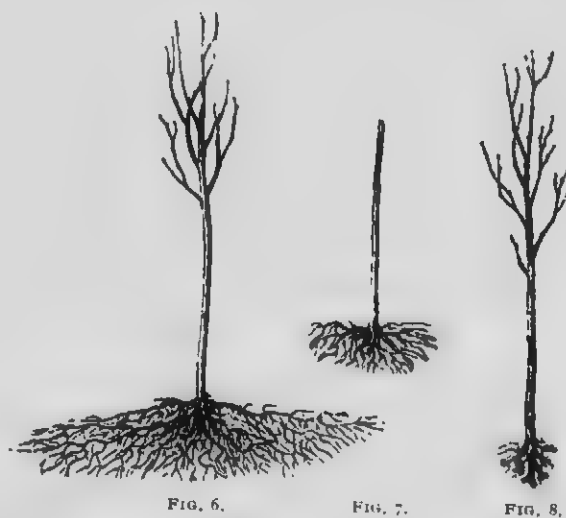


FIG. 6. FIG. 7. FIG. 8.
Fig. 6.—The tree as it stands in the nursery row.
Fig. 7.—The tree as it should be dug with fair proportion of fibrous roots.
Fig. 8.—The tree as it is often dug by careless men.

(Thomas.)

Where it is convenient to do so, the buyer should visit the nursery and superintend the digging of his trees, choosing those which are stocky and well formed, and seeing that the small feeding rootlets are not cut off by careless diggers. Three-year-old trees are usually sold by nurserymen, and this is a proper age for planting in the orchard, for if older they suffer much loss of root system in transplanting.

After the trees are dug the roots should be kept covered with

a damp cloth or other protection from wind and sun, lest they lose vitality by drying out.

If the trees are ordered through a traveling agent, care should be taken to see his credentials and to be sure that he represents a firm of good reputation, and that he is authorized to sell for that firm.

We would further caution the inexperienced apple grower against investing much money in high priced novelties. In most cases these prove to be no better than, and often inferior to, the standard varieties, and it is soon enough to spend money on them after they have been thoroughly tested at some one of the Experimental Farms.

As soon as the trees arrive from the nursery they should be planted, or, if the quantity is large, or the ground not quite ready, they should be "heeled in," that is, stood in a trench and the roots covered with fine earth. The bands, holding the varieties in separate bunches, should be cut to loosen the roots apart a little and allow the fine earth to come in close contact with them. The kinds should be kept separate in some other way.

Number of trees to the acre.—In estimating the number of trees required to plant a certain plot of ground the following table may be useful, remembering that a square of 210 feet each way is approximately an acre, or about 44,000 square feet, or more exactly 4,840 square yards.

40 feet apart	27 trees
33 feet apart	40 trees
25 feet apart	69 trees
20 feet apart	108 trees
15 feet apart	193 trees
12 feet apart	302 trees
10 feet apart	435 trees

Preparing the ground.—The plot of ground to be devoted to the apple orchard should be well worked up the year previous, preferably with potatoes, and, if at all wet, thoroughly drained; for while the apple tree may endure a certain degree of wet soil, yet if not drained to allow of the escape of the surplus water, the trees so situated will become stunted in growth and the fruit crop very uncertain.

Presuming that the orchard ground has been fall ploughed,

it should be harrowed as soon as dry enough in the spring, and then very carefully staked out before beginning to plant. Crooked rows might be endured for a single season, but when they must remain for a lifetime, it is an unpardonable mistake to set them out of line.

Laying out the orchard.—The distance apart for setting the trees must be governed by climate, soil and variety. In the deep, rich soil of some parts of Ontario, especially near the escarpment known as the "Mountain," which may be traced from Queenston Heights up to Collingwood, forty feet apart is not too much, while in heavier soil or farther north, thirty feet is far enough; while in the North-West, where growth is less vigorous, and hybrid crabs are much planted, sixteen feet apart is considered a sufficient distance.

A simple and accurate method of staking out an orchard for planting was given in the *Canadian Horticulturist*, and is illustrated in Fig. 9.

"Take a long wire, No. 12 will usually be the right size (in small orchards a cord will do), and mark off the required distances on it, either by a scratch of a file or by tying on a piece of waxed thread. Let each end of the wire be attached to a strong stake. A B C D represents the field. Measuring the distance from the fence, where the first row of trees is to start, stretch the base line F to G, placing a small stake at each mark on the wire. Take up the wire and in the same way stake out F H and H I. The wire is then simply stretched from J to K and so on down the field, staking out as before. Quite small stakes, a few inches long, will do, as no sighting is required.

With this plan a planting board, as in Fig. 10, is necessary. Take a strip of board five or six inches wide, and about six feet long, cut out a notch in the middle of one side and bore holes through the ends at exactly the same distance from the notch. The notch should be about the diameter of the tree trunk.

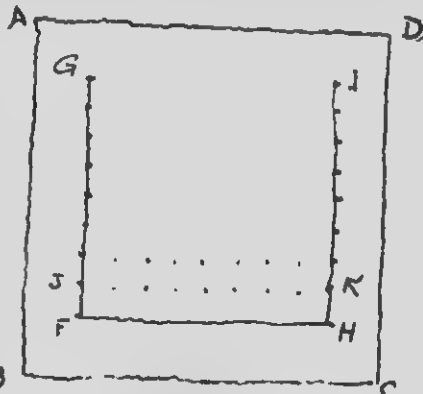


FIG. 9.

When all is ready for planting the board is placed so that the notch fits around the stake; pegs are then put through the holes, the board lifted up over them and the hole dug; the board is then replaced on the pegs and the tree placed so that it fits into the notch. If haste is necessary, one man can go ahead with a duplicate board and a supply of small pegs, digging the holes and leaving the pegs for the guidance of the planter.

Planting the trees.—If the ground has been fall ploughed and the staking carefully done, the planting can be quickly com-

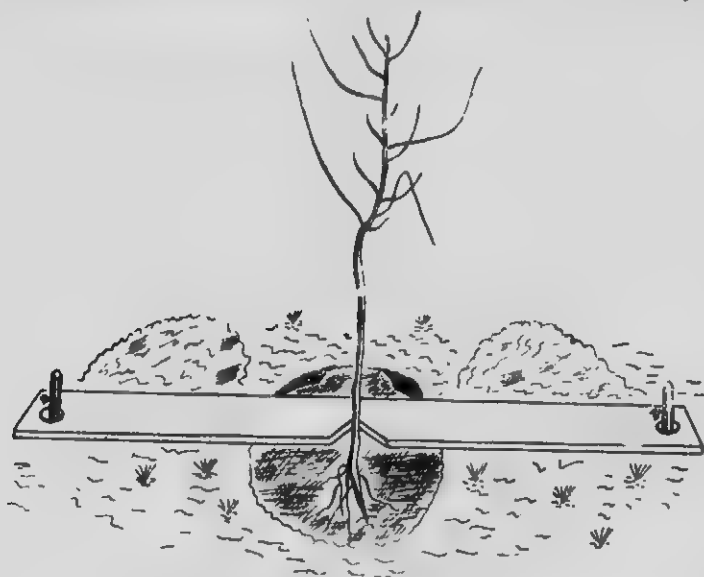


FIG. 10.—How the Planting Board is used.

pleted. One man will plant fifty trees a day in a loose soil such as a sandy loam, and do the work well; and, if the trees are only two years old, nearly double this number.

The hole should be dug a little wider and deeper than the roots require, and filled in underneath and about the roots with the finest of earth. It is of the utmost importance to firm the earth about the roots while filling in, frequently tramping it with the foot, excepting the last few shovelfuls, which should be left loose to act as a mulch.

Before setting it, each tree should be pruned with a sharp knife, cutting off the roots that are broken or too extended, and cutting the top well back. In the case of three- or four-year-old

apple trees, the top may be formed at the desired height, say, at three feet from the ground, with three or four branches, each of them shortened back a third or more, and all others removed close to the trunk; but with younger trees, it is best to prune them to whips on setting them out and to cut off the top at the proper height for forming the head. The object of cutting back the top of a tree in transplanting is to maintain a proper proportion between roots and branches, so much of the former is lost in digging them out of the nursery rows.

Macoun says that in the colder parts the best results will be had by starting the top within one or two feet of the ground, as the tree trunks will in this way be much better protected from sun scald than if the branches start higher up. It is possible that methods of cultivation may be so modified in the future, and such suitable implements provided, as to result in our obtaining better results, even in the older apple growing sections, from trees branching quite near the ground. (See Fig. 11.)

The tree should not be set in the orchard more deeply than it stood in the nursery; indeed, if the ground is heavy or at all inclined to be wet, it is better to set the tree very shallow, and on the top of a land rather than in a furrow.

For Manitoba, however, Stevenson recommends planting apple trees from three to six inches deeper than they stood in the nursery. He also advises low-headed trees, branching about a foot from the ground, because tall trunks in that country suffer much from sun scald, or the effects of warm sunshine on the bark after very intense cold. As a protection for such trees he uses a wrap of burlap or thick paper.

When planting apple trees on heavy land, we find it a great advantage to have a wagon load of sandy loam at hand for use in filling in about the roots and for mulching over the surface about the tree. This treatment will both improve the soil texture and tend to conserve moisture in summer.



FIG. 11.—Three-year-old Low-headed Apple Tree.

In sections where a drought is probable after the planting season, it is a useful precaution to mulch the newly planted trees, 4 or 5 inches deep, with manure, sawdust, straw or other substance, in order to keep the surface soil loose and prevent evaporation of the soil moisture.

An orchard register.—It is always important, as well as interesting, to know the names of all the varieties planted in an orchard, but labels are soon lost, and frequently the owner has difficulty in identifying the varieties even when they come into bearing. To avoid this difficulty a plan of the orchard should be drawn in a record book, and the names of the kinds so shown as to be easily located. The wooden label that comes from the nursery is of a very temporary character, and if a label is needed to remain upon the trees after planting, an excellent one is made of a narrow strip of zinc 5 or 6 inches long, and perhaps a half inch in width, narrowing down to one end so that it may be wound two or three times about a limb. Pencil marks on zinc are almost indelible after exposure.

In the orchard plan it is well to include some marks to show where the tile drains lie. A post or a stone, set at the extreme upper end of a drain, and another at the point where it empties into a main, answers a good purpose, and these points should also be indicated on the orchard register. Then, in case of stoppage of the tile by tree roots, it will be comparatively easy to locate the difficulty. Drains put in without any marks, or any key to indicate their locations, are often lost sight of entirely, and become choked, neglected and useless.

CHAPTER VI.

CO-OPERATION IN APPLE GROWING.

Co-operation is without doubt the keynote of successful apple growing, whether it be in planting, spraying, packing, buying supplies or marketing.

Many fine apple orchards in the Province of Ontario are much depreciating in value because of the great number of different varieties. Some years ago, when the writer was asked to make up experimental fruit shipments to Great Britain for the Canadian Department of Agriculture, it was found next to impossible to make up a straight car load of any one variety without gathering from many points. Now mixed lots are objectionable in the great markets and have to be sold at a sacrifice, while car lots of a single favorite kind meet with ready sale. The remedy lies in co-operative planting. The fruit growers of any locality, desiring to combine for securing the best success, should decide upon those few varieties necessary to cover the season, and which usually bring the highest market prices, as learned from past experience; they should then arrange among themselves to plant a sufficient acreage of each, so that when in bearing they could readily combine to make up car lots for successive shipments, either to Europe or to our great North-West.

The Gravenstein apple, for example, is one of the finest fall apples for either export or home uses. This apple is grown in great abundance in Nova Scotia, whence it is shipped in car lots to Great Britain, and is earning for the Annapolis Valley a high reputation. This apple reaches the same perfection in the southern parts of Ontario, and yet nowhere can one find an orchard of Gravensteins, nor even gather together enough for a car load at any one shipping point.

The Blenheim is another apple very little planted in Ontario. It fills in the gap between the Gravenstein and the King, and is a fine export variety, but where can one make up a straight car load of Blenheims?

We do not speak of these two apples to commend them above others, but to show the mistake of planting an orchard to a great number of varieties, with not enough of any one kind

to fill out a car lot. A co-operative association in a locality should be able to advise its members about uniting in the planting of certain varieties of high commercial value in sufficient quantities to insure respectable shipments.

Forms of Application for Charter.—Since so many co-operative associations are being formed in Canada, we give below a copy of the forms used in the Province of Ontario in applying for a charter:

FORMS OF APPLICATION FOR CHARTER

(For Associations Without Share Capital.)

PETITION.

To His Honor JOHN MORISON GIBSON, Esq., K.C., LL.D.,
Lieutenant-Governor of the Province of Ontario

The petition of

.....

.....

.....

.....

..... sheweth as follows

1. Your petitioners are desirous of obtaining by Letters Patent, under the Great Seal, a charter under the provisions of the Ontario Companies' Act, constituting your petitioners and such others as may become members of the corporation thereby created a body corporate and politic without share capital under the name of
or such other name as shall appear to Your Honor to be proper in the premises.

2. Your petitioners have satisfied themselves and are assured that the corporate name under which incorporation is sought is not on any public ground objectionable, and that it is not that of any known association, incorporated or unincorporated or of any partnership or individual, or any name under which any known business is being carried on, or so nearly resembling the same as to deceive.

3. Your petitioners have satisfied themselves and are assured that no public or private interest will be prejudicially affected by the incorporation of your petitioners as aforesaid.

4. Your petitioners are of the full age of twenty-one years.

5. The object for which incorporation as aforesaid is sought by your petitioners is:

(a) To carry on a co-operative association for the handling, marketing and otherwise disposing of fruit, vegetables, cereals and all other produce of the farm; (b) for the purchase and distribution of machinery, implements, utensils and all articles used on the farm; (c) for providing cold storage, refrigerator warehouses, wharves and all means of handling and dealing with farm produce, and for packing, preserving, manufacturing or otherwise dealing with farm produce.

6.

.....

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.....

are to be the Provisional Directors of the Corporation.

7. Your petitioners have subscribed to a memorandum of agreement in duplicate setting out the purposes and objects of incorporation and provisions for administering the affairs of the corporation.

Your petitioners therefore pray that Your Honor may be pleased by Letters Patent under the Great Seal to grant a charter to your petitioners and such others as have or may become subscribers to the memorandum of agreement of the Corporation thereby created, a body corporate and politic for the due carrying out of the undertaking aforesaid.

And your petitioners as in duty bound will ever pray.

Signatures of Witnesses.

.....
.....
.....
.....
.....

Signatures of Petitioners.

Dated at this day of, 19...

(For Associations Without Share Capital.)

Memorandum of the agreement of the Association, made and entered into this

day of

1. We the undersigned do hereby severally covenant and agree each with the other to become incorporated under the provisions of The Ontario Companies' Act as a corporation without share capital for the purposes and objects following:

(a) To carry on a co-operative association for handling, marketing and otherwise disposing of fruit, vegetables, cereals, and all products of the farm;

(b) For the purchase and distribution of machinery, implements, utensils and all articles used on the farm;

(c) For providing cold storage, refrigerator warehouses, wharves and all means of handling and dealing with farm produce, and for packing, preserving, manufacturing and otherwise dealing with farm produce.

2. The subscribers to the agreement shall be the first members, and it shall be determined by by-law the terms and conditions on which subsequent members shall from time to time be admitted.

3. The following shall be the first Directors of the Corporation:

.....
.....
.....

4. The first general meeting shall be held at such time not being more than two months after the incorporation of the Corporation, and at such place as the Directors may determine.

5. Subsequent general meetings shall be held at such time and place as may be prescribed by by-law of the Association.

6. Special meetings of the members may be held at any time upon call of the President by written notice mailed to each member five days before the meeting. Special meetings shall also be called by the President whenever required to do so in writing by any five or more members.

7. At any meeting of the Association ten members shall constitute a quorum for the transaction of business.

8. At the annual meeting of the Association, five Directors shall be elected of whom three shall constitute a quorum. There shall also be elected two auditors who shall hold office until the next annual meeting unless previously removed by a resolution of the members at a general meeting.

9. The officers of the Association shall consist of a President, Vice-President, Secretary, Treasurer, Manager, who shall be elected by the Directors at the first Board meeting to be held within a week after the annual meeting.

10. The Directors may select three of their number to act as an Executive Committee to have general charge of the affairs of the Corporation.

11. When a vacancy shall occur through any cause in any of the offices established by the by-laws of the Association, it shall be filled at the next meeting of the Directors.

12. The members at the annual meeting or at a general meeting may by by-law agree to pay the officers of the Association for their services.

13. Other by-laws for the guidance of the Association may be adopted, or the present by-laws may be amended by a majority vote of the members at any regular or special meeting of the Association.

In testimony whereof we have hereunto set our hands and affixed our seals.

Dated at this day of, 19..

(For Associations With Share Capital)

PETITION.

To His Honor JOHN MORISON GIBSON, Esq., K.C., LL.D.,
Lieutenant-Governor of the Province of Ontario.

The petition of

.....humbly sheweth as follows:

1. Your petitioners are desirous of obtaining by Letters Patent, under the Great Seal, a charter under the provisions of The Ontario Companies' Act, constituting your petitioners and such others as may become shareholders in the Association thereby created, a body corporate and politic under the name of The, or such other name as shall appear to Your Honor to be proper in the premises.

2. Your petitioners have satisfied themselves and are assured that the corporate name under which incorporation is sought is not on any public ground objectionable, and that it is not that of any known company, incorporated or unincorporated, or of any partnership or individual, or any name under which any known business is being carried on, or so nearly resembling the same as to deceive.

3. Your petitioners have satisfied themselves and are assured that no public or private interest will be prejudicially affected by the incorporation of your petitioners as aforesaid.

4. Your petitioners are of the full age of twenty-one years

5. The object for which incorporation as aforesaid is sought by your petitioners is (a) to produce, purchase, sell and deal in fruit and other food, farm and dairy products and the various materials entering into the production thereof; (b) to manufacture, lease, purchase and sell all machinery, tools, implements, apparatus and all other articles and appliances used in connection with any or all of the purposes aforesaid or with selling or transporting the manufactured and other products of the Association; (c) to carry on the business of refrigeration, cold storage, ware-housing, wharfing, forwarding agents and preservers and packers of provisions of all kinds

6. The head office of the Association will be at

7. The amount of the capital stock of the Association is to be dollars.

8. The said stock is to be divided into shares of dollars each.

9. The said

are to be Provisional Directors of the Association

10. By subscribing therefor in a memorandum of agreement, duly executed in duplicate, with a view to the incorporation of the Association, your petitioners have taken the amount of stock set opposite their respective names, as follows:

Petitioners.	Amount of Stock Subscribed for
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$

Your petitioners therefore pray that Your Honor may be pleased by Letters Patent under the Great Seal to grant a charter to your petitioners constituting your petitioners and such others as have or may become subscribers to the memorandum of agreement and stock book of the Association thereby created a body corporate and politic for the due carrying out of the undertaking aforesaid.

And your petitioners as in duty bound will ever pray.

Signatures of Witnesses.

.....

Signatures of Petitioners.

Dated at this day of, 19..

CHAPTER VII.

DWARF APPLES.

Since the production of No. 1 apples has become so dependent upon judicious pruning, spraying and thinning, some apple growers are turning their attention to the planting of dwarf apple trees. Standard apple trees reach a height of from 30 to 35 feet, with a spread covering about the same area. Manifestly it is next to impossible to thoroughly spray such trees, and besides, the gathering of the apples is very expensive.

A dwarf apple tree, on the other hand, is convenient to reach for all purposes, and can be as thoroughly sprayed as a plum or a peach tree. According to Wright, an English apple grower, the prominent advantages of growing apples on dwarf trees are as follows:

1. Quick returns.—Standards must do exceptionally well to produce anything like a paying crop under twelve to fourteen years, while dwarfs begin to bear the second or third year after planting.

2. All work can be performed from the ground level.—This is an important consideration in pruning, thinning fruit, gathering fruit, and treating insects and diseases.

3. Gales cause less injury to the trees and to the crop.

4. All inferior fruit can be thinned out.

Dwarf stock.—For very small dwarfs the French Paradise stock has been in use in England during the last century and is well adapted to the Cordon and the Espalier training so often employed there; but, for the commercial orchards of Canada, perhaps the Doucin stock would be more desirable because it does not dwarf the trees to such an extreme, and it easily unites with the wood of all our orchard varieties.

Yield.—Castle stated, at a meeting of the Western New York Horticultural Society, that prolific varieties on dwarf stock, planted 10 x 10 feet, or 435 to the acre, taking an average of ten years, would yield from one-fourth to one-half bushel per tree per annum, or from one hundred to two hundred bushels

per acre; and Barry reported that well-established trees of productive sorts, on standard stock planted 8 x 8 feet apart, had borne as much as two barrels of good fruit per tree.

Lodeman said, in 1896, that Paradise dwarfs were the only ones that had been cultivated to any extent in the United States, and advises 10 x 10 feet as a suitable distance for setting them. He claims that a uniform plantation of well-grown trees, after reaching full maturity, should yield about 125 barrels of apples per acre, which is very little less than the average annual yield from an acre of standard trees. For, while a standard apple tree may yield eight or ten barrels, it usually rests each alternate year, so that, taking an average of eight or ten years, standards seldom make a better average than four barrels per annum. At this rate, supposing the standards to be set 33 feet apart with 40 trees to the acre, the probable average yield of that acre would be 160 barrels, or, at 40 feet apart and 27 trees, only 108 barrels.

Rivers writes of an orchard of Cox's Orange on Paradise stock, at three years planted, yielding an average of a peck per tree; while Cheal speaks of a dwarf tree of Warner's King yielding six pecks at five years from planting. Both these men are nurserymen in the South of England. Pederson gives 140 bushels per acre as a good yield from trees on Paradise stock in Denmark.

Most varieties of apples succeed on dwarf stock, but the Gravenstein is especially recommended. Barry recommends the following list: Astracan, Alexander, Duchess, Gravenstein, Hawthornden, Maiden's Blush, Spy, King, and a few others.

On the whole, however, we have not sufficient data upon which to base definite advice regarding the growing of dwarf apples, but we may conclude that the Paradise is at present the best available stock, that these may be planted as close as 8 x 8 feet, and that the fruit grown on them is handsomer and of better quality than that grown upon standards.

We would not be understood as advising the planting of dwarf apple trees to any extent, outside the garden, except in an experimental way, because it has not been as yet demonstrated that they are as profitable as the standard trees.

CHAPTER VIII.

TILLAGE OF THE APPLE ORCHARD.

That the apple orchard does not require much, if any, cultivation is a very prevalent error, and, as a result, we find many orchards stunted in growth, badly affected with borers, canker, codling moth and scale insects, for slow growers are much more subject to disease than vigorous trees.

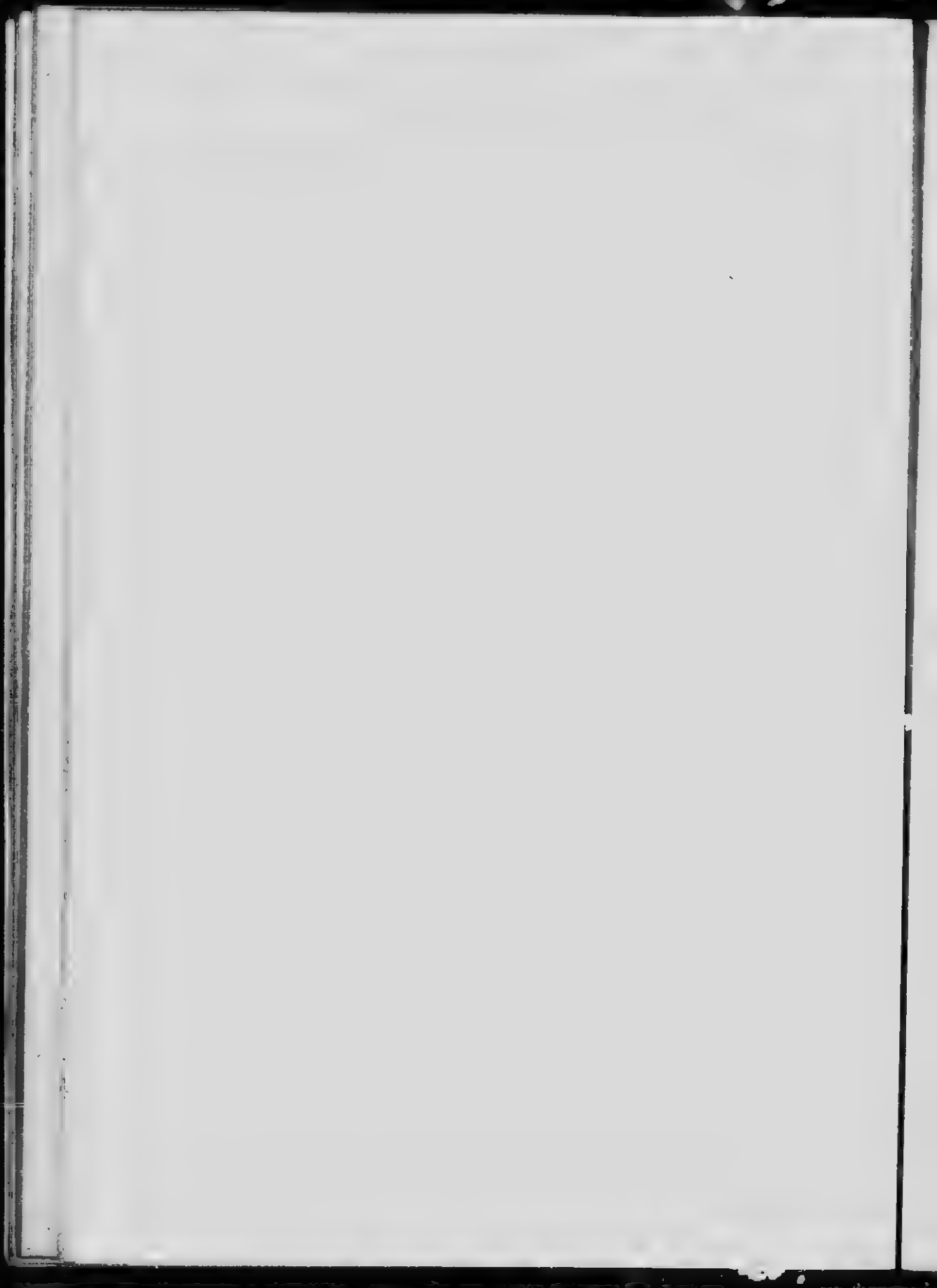
For the best success in apple growing, thorough cultivation should be given the orchard from the time of planting until bearing age is reached. Constant tillage, especially throughout the growing season, is not, as some seem to suppose, simply to kill weeds, but also to render the plant food in the soil more available for the rootlets, and to make it possible for the roots to reach out throughout a wider area in the work of gathering sustenance for the growth of the tree. During these years hoed crops may be grown on the ground to pay for the labor, such as potatoes, turnips, indian corn, beans, etc., but in no case should the orchardist be tempted to sow grain crops to grow during the months of June and July, for they act as pumps to draw up the moisture from the soil, and they tend to check the tree growth at a time when it should be the greatest.

After the orchard has reached bearing age it may sometimes appear that a too vigorous wood growth postpones the time of fruit bearing, in which case the ground may be seeded down to clover and so left for a year or two, and then broken up again for continued cultivation. The ploughing under of the clover will also greatly enrich the soil by the addition of nitrogen.

Importance of cultivation.—The importance of frequent stirring of the soil in the apple orchard will be evident to any one who observes the difference in the size, color and grade value of the fruit of trees under cultivation, from that grown in sod. Of course, there are exceptional conditions, which may justify leaving an orchard for some time in grass, as, for example, in the case of some of the older apple orchards close under the great Niagara escarpment in Ontario, where the deep sandy loam is so rich and full of humus that it retains



A WELL TILLED APPLE ORCHARD IN MAY, COVER CROP PARTLY PLOUGHED UNDER



much moisture during the hot months. Instances of this kind have led some persons to advocate growing apple orchards in sod, which under ordinary conditions would be a serious mistake.

Tillage vs. Sod.—Hedrick conducted careful experiments in New York State to determine what the comparative effects of tillage and sod are upon the apple. He says: "The average cost per acre for the two methods of management, not including harvesting, was \$17.92 for the sod, and \$24.47 for tillage, giving a difference of \$6.55 in favor of sod. The average net income per acre for the sod plot was \$71.52, for the tilled plot \$110.43, a difference of \$38.91 in favor of tillage, an increase of 54 per cent. for tillage over the sod-mulch method of management." In general Hedrick draws the following conclusions:

"Nearly all the plants which minister to the needs of man are improved by tillage; the apple does not seem to be an exception.

"Results as positive as in this experiment can be made very comprehensive; they should apply to all varieties of apples and to nearly all soils and locations.

"The experiment does not show that apples cannot be grown in sod; it suggests, however, that apples thrive in sod, not because of the sod, but in spite of it.

"While moisture is by no means the only factor to be considered in the controversy over the sod and tillage methods of managements, it appears to be the chief one.

"There is nothing in this experiment to indicate that trees will become adapted to grass. The sodded trees began to show ill-effects the first year the orchard was laid down to grass and each succeeding year has seen greater injury."

The Dust Mulch.—As we have already indicated, one great object of cultivation is the conservation of moisture during the hot months when rains are not frequent. The best possible agent to retain the soil moisture is the so-called "Dust Mulch," which simply means a thin layer, say about three inches deep, of fine dry earth on the surface of the ground, to check the evaporation. To maintain this, after once the ground is in good tilth, a frequent harrowing will suffice say about every fortnight, or as often as it becomes necessary to prevent the formation of a crust upon the surface. In explanation of the action of the dust mulch, we quote from Storer: "The surface soil will naturally have settled down upon itself,

since it was disturbed for the planting, and there will be found a more or less perfect capillary connection between the surface and the underlying soil in which the water is stored. So long as this good capillary connection is maintained, much water will be rapidly drawn up to the surface and will there be evaporated off into the air, without serving any useful purpose for the maintenance of the crop. But, if dry surface soil be scratched or stirred, and made loose and light, the capillary connection with the underlying soil will be impaired, and the power of the soil to bring up water to the very surface will be greatly lessened."

Fall ploughing of the apple orchard is very useful, especially in those sections where winter protection of the roots by cover crops is not necessary. Exposure of the particles of the soil to the air during the frosts of winter has not only an excellent mechanical effect in soil disintegration, but, beside this, the oxidation of the soil by exposure to the air is often of great value, destroying or breaking up certain chemical combinations unfavorable to tree growth, and thus rendering the plant food already stored up in the soil the more available.

Cover crops.—It has become the practice of some of our best orchardists to keep up the cultivation of the orchard, either by disc or harrow, until the end of summer and then to sow a cover crop of some kind to act as a mulch to keep down weeds and to protect the roots from freezing in winter, and also to add vegetable matter to the soil when ploughed under the following May.

Bailey gives the following ways in which a cover crop may be useful in improving the soil:

"I. It directly improves the physical condition of the land; prevents hard soils from cementing; holds the rains and snows until they have time to soak away into the land; dries out the soil in spring, making early tillage possible; sometimes serves as a protection from the frost.

"II. It improves the chemical conditions of the soil; catches and holds some of the leaching nitrates; adds humus; renders plant foods available; appropriates nitrogen if it is leguminous."

Of course, cover crops are only useful between the months of August and May, that part of the year during which tree growth is not to be encouraged or when the roots need protection; but from the end of May until the beginning of August is

the season of tree growth, and the period when constant cultivation is very important.

In the milder parts of Canada, where root freezing is not feared, little attention is given to cover crops; but, when the apple crop is harvested, the grower puts in his plough and turns over all the soil of the orchard before winter, if at all possible.

Choice of cover crops.—Various plants may be used as cover crops. One of the best is Rye. It may be sown some five or six weeks before winter is expected at the rate of from one to one and a half bushels per acre. It should not be left too long growing in the spring, but should be ploughed under about the middle of May, or it will tend to rob the ground of moisture required for starting the tree growth.

Bailey says, "the golden scale of cover crops for orchards begins with rye and ends with crimson clover," but so far, we have had very little satisfaction sowing the latter in Canada.

Other cover crops used in Canada are Buckwheat, Oats, Hairy Vetch, Peas and Common Red Clover.

The following table shows the quantity of seed required per acre for cover crops in young orchards:

Buckwheat	1 bushel
Clover, red	6—12 pounds
Clover, crimson	8—16 pounds
Corn	2½—3 bushels
Cow Pea	2 bushels
Oats	2½—3 bushels
Peas	2—3 bushels
Rye	1½—2½ bushels
Vetch	1 bushel

CHAPTER IX.

MANURES FOR THE APPLE ORCHARD.

It is only of late years that farmers and fruit growers have begun to realize the necessity of fertilizing the apple orchard in order to make it profitable. In former years all the barnyard manures went out to the potato patch or to the corn field. In those days nobody seemed to dream that the growing of apples drew as heavily as wheat upon the soil fertility; but intelligent investigation has now shown that it draws more heavily, and, therefore, that the orchard is in even greater need of manure than many other crops.

Roberts, of Cornell, shows that an average crop of apples and apple leaves from an acre removes from the soil about 21 pounds of nitrogen, 3 pounds of phosphoric acid, and 26 pounds of potash; while the quantity of plant food removed from an acre by a grain crop in one year is approximately 21 pounds of nitrogen, 8 pounds phosphoric acid and $5\frac{1}{2}$ pounds of potash.

The student of agricultural chemistry knows that the three elements above mentioned constitute a complete manure, and that each one does its part in making up the plant growth. Generally speaking, the nitrogen encourages leaf growth; the potash is found to constitute a large part of the ash of the fruit and of the wood, and is the base of the fruit acids; while the phosphoric acid seems essential to the complete nourishment of the tree and to insure proper ripening of the fruit.

Commercial fertilizers.—On the ground of these facts the agent for commercial fertilizers makes many large sales to fruit growers. In some instances excellent results are reported, in others there is little evidence of benefit; perhaps because these fertilizers are too concentrated to be well distributed; or the land may need humus or draining or other improvement. In most instances, at any rate, it is more judicious for the fruit grower to purchase commercial fertilizers separately rather than ready mixed, viz., nitrate of soda for nitrogen, ground phosphate rock or bone meal for the phosphate, and muriate of

potash or kainit for the potash, and learn to apply them each where he finds them most useful.

In some sections, where wood is used as fuel, the potash can be easily procured in the form of wood ashes for as little as 10 or 12 cents a bushel, and this will constitute an economical way of securing the potash, for, if unleached, wood ashes contain from 6 to 8 per cent. of potash, which latter is worth from 5 to 6 cents a pound. Fifty bushels of wood ashes per acre is about the proper amount to apply; or, if muriate of potash is used, about 200 pounds per annum of this would be a fair application.

The plain superphosphate (ground apatite) contains about 17 per cent. of phosphoric acid and may be applied to the bearing orchard at the rate of about 200 pounds per acre. Thomas Sag has been sold in some parts of Canada for its phosphoric acid, but many fruit growers complain of lack of result, perhaps because they looked for it too soon, for its effects upon the soil are very slow in developing. Bone meal is another substance rich in phosphoric acid. Storer says: "Many farmers living in New England have found that mixtures of bone meal and wood ashes serve them an excellent purpose when used as substitutes for farmyard manure. On good land the materials are applied at the rate of 500 to 600 lbs. of bone meal to the acre, together with 15 to 25 or 30 bushels of the ashes."

It would appear that commercial fertilizers are not a profitable investment for the orchard in every instance, and must be judiciously employed or they may prove very disappointing. Frequently orchard soil is lacking in humus, and, if clay, is often hard and cloddy, or, if sand, is too porous; in either case a mechanical change in the condition of the soil is necessary before such fertilizers can have much effect upon tree growth. Providing that tillage and underdraining have been attended to, the addition of humus in some form may be the first thing needed, in order to bring about that physical condition necessary in the soil for receiving the full benefit from the application of commercial fertilizers. This will loosen the hard, lumpy clay, or, in the case of sandy soil, tend to hold together the coarse particles, so that they may be applied with some confidence.

Yard manure.—Where it can be procured, barnyard manure is of all fertilizers the most desirable, because it con-

tains all the necessary elements of fertility in itself, and in the proper proportions, together with a sufficient amount of vegetable matter to enable these elements to have the desired effect. Voorhees says: "To provide vegetable matter and to improve the physical quality of poor soils, apply yard manure once in four years, in fall or winter, at the rate of from five to ten tons per acre. To aid in the decomposition of vegetable matter, and to insure a sufficiency of lime as plant food, apply lime at the rate of twenty-five bushels per acre, once in five years. To provide in addition, an abundance of all forms of available plant food at the times needed for the development of the tree and the fruit, apply annually chemical fertilizers in the following proportions:

Nitrate of Soda	100 lbs.
South Carolina Rock Superphosphate...	100 lbs.
Ground bone	200 lbs.
Muriate of Potash	200 lbs.

"The amounts to be applied depend upon the character of the soils, the kind of fruit, and the age and vigor of the tree; those given perhaps mark the minimum."

Value of Humus.—Storer observes that "the value of humus as manure depends upon a variety of properties. In the first line, no doubt, must be placed its power of supplying nitrogen to the plant.

"Then by virtue of its porosity, it imbibes and absorbs and holds water, and the vapor of water. By its lightness, too, it improves the texture of many soils. And it absorbs and holds ammonia and the salts of ammonia, as well as various other substances.

"It promotes chemical action in the soil, both by means of the acids contained in it, and by those of the crenic and apocrenic* acids which are formed by its decay. Moreover, by its slow decay, humus supplies carbonic acid for the dissolving of plant food.

"Some of the materials rich in humus, such as marsh mud, harbor mud, and pond mud, may even be valuable occasionally

* Apocrenic, a brown, gummy, amorphous, soluble compound derived from humus, which performs an important function in the growth of plants, as there is every reason to believe that it forms one of the stages through which matter travels from dead plants again into the living vegetable tissue.

because of the inorganic constituents which are contained in them.

"But while humus is valuable upon dry soils, helping them to retain moisture, it may be injurious upon wet soils, tending to make them boggy and cold."

Mixing soils.—We have found good to result from mixing soils about apple trees. In one part of an orchard the ground was a heavy clay, and, in another, a light sand in somewhat elevated knolls. Considerable quantities of the latter were drawn and put around the trees on the heavy soil, and a gradual mixing of the two seemed to be of signal benefit to the soil texture.

Judicious application of manure.—All portions of an orchard may not need manure every season. The vigor of the trees will be shown by their annual growth, and if this is sufficient with tillage alone, without manure, showing a foot or thereabout of new wood on trees of bearing age, the manure may be withheld, lest the trees give too much wood and too little fruit.

It is often convenient, and indeed advisable, to cart out the barnyard manure about the orchard trees in winter, as fast as it is made.

This practice is a saving of the more precious time in the spring, while none of its fertilizing properties are lost; indeed, there is an advantage in the greater bulk in the distribution, and all danger of fire fang is avoided.

On the other hand, there is often much coarse and strawy manure which cannot be readily ploughed under, and this should be piled up in compost to rot until it is in a fit condition to be spread.

CHAPTER X.

PRUNING APPLE TREES.

Two extremes in pruning are to be avoided, viz., (1) the too little use of the saw and clippers, and (2) the reckless butchery of the tree. Some there are who insist on sawing off the lower limbs, big and little, year after year, until much of the bearing wood is beyond the reach of the longest ladders while others contend that a tree should be largely left to nature and the result is a tangled mass bearing little or no fruit worth gathering.

If the pruner would more closely define in his own mind the objects in view, he could do more intelligent work. Every cut should be made with a reason, and each tree should be pruned annually, so that it may seldom or never be necessary to remove large limbs.

Roberts, of Cornell, speaking of the importance of thorough but judicious pruning, says: "We grow too much timber in our apple orchards. Is the plant food improved in quality by being transported through eighty feet of wood before reaching the fruit which it is destined to support. Our orchards are growing too much wood, too many seeds, and too many poorly flavored apples. If by heading back the top and furnishing a reasonable amount of plant food, by fertilizing, cultivating, or by keeping sheep in an orchard, we can remedy this difficulty, a great advance will be made."

When to prune.—In mild sections apple growers do a large part of their pruning during the winter, when little else can be done; but in other parts it is best to wait until the severe weather is past, or to prune in the autumn, just after the leaves have begun to fall. Light pruning may be done at any time in the summer; indeed, a favorable time for wounds to heal is during June and July, when the growth is most rapid. Summer pruning, however, tends to check the vigor of the tree, because it robs it of a certain quantity of potash and phosphoric acid which is at that time in the foliage. By the time the leaves begin to fall in autumn, these elements are mostly given back

to the wood cells of the tree, so that the tree does not suffer any check in vigor by the natural loss of its foliage.

But if the tree is making too much wood and yielding little or no fruit, summer pruning tends to check it and to encourage fruit bearing. Much the same effect might result from lessening cultivation or withholding fertilizers for a time. If a tree is making less than a foot of new wood it needs fertilizing, shortening back and cultivating, in order to encourage growth; if, on the other hand, it is making a foot or more of young wood during a single season, these means of increasing vigor may be withheld.

How to prune.—The pruning of an apple tree should begin with the day it is planted out in the orchard. The nurseryman usually tops his trees in the nursery rows at from four to five feet from the ground in order to cause the formation of a head; the planter should cut back the branches so formed somewhat as shown in Fig. 12, taking care that a crotch is not formed by forking branches which, in after years, might split apart with a load of fruit.

At the end of the first season of growth after planting, the tree will have attained somewhat the form shown in Fig. 13.

The pruning now, and for the future, will be more a matter of judgment than of rule, always keeping in view the ideal of the future form of the tree.

The weaker limbs and those crossing each other should, of course, always be removed and the growth of the branches directed by the pruner.

The natural habit of growth of the different varieties should be carefully studied and encouraged. Such kinds as Greening, Roxbury and King are spreading in habit as shown in Fig. 14 (after Bailey), and for such varieties the early pruning of the young tree is well shown in Fig. 13.

But the habit of a Spy and, to a less degree, that of the Baldwin is somewhat pyramidal, as shown in Fig. 15, and for such



FIG. 12.



FIG. 13.

growers a leading upright shoot should be permitted to grow, from which the side branches are to be trained. To attempt to make a Spy grow like a Greening would naturally result in filling the centre of the top with numerous so-called suckers.

The trees of upright habit may have the head formed nearer the ground than those of spreading habit; but the head of an apple tree must be high enough to permit easy cultivation with a horse; and it must be remembered that when the trees come into bearing the limbs which spread will droop more and more with weight of foliage and fruit, and often become very trouble-



FIG. 14.—OPEN CENTRE SYSTEM. (Bailey.)

some to the ploughman. He then vows vengeance upon those limbs and off they come, without regard to the symmetry of the tree, or the injury to its health. These great wounds seldom heal over, but usually rot away into the heart of the tree and make it hollow; and, besides, there is a tremendous waste of tree energy expended in producing these immense branches, which, rightly directed by annual and intelligent pruning, would have been conserved for permanent growth and productiveness. If, however, large wounds must be made, they should be painted to preserve the cut surface from rotting.

In pruning an apple orchard one should so thin out the smaller branches of the head, that every part will be productive; but the common notion of pruning seems to be simply the lessening of the size of the top; and, hence, either from ignorance or laziness, and in order to do the work quickly, the pruner saws off half the tree, leaving the remaining half still as much in need of thinning out as before. Such a pruner will cut off the larger lower limbs bodily, until the tree loses all symmetry and re-



FIG. 15.—MAIN LIMB CARRIED UP. (Bailey.)

minds one of those old-fashioned Shanghai roosters of our grandmother's fowl yard.

An important point to be observed is to cut limbs close to the trunk or main branches, so as to avoid leaving short stubs as in Fig. 16. This stub cannot heal over. It will remain hard and dry until finally it causes decay in the very heart wood of the tree. If such cuts are made close, the growing bark will have a tendency to cover the cut surface as in Fig. 17.

Pruning for fruit.—In the bearing orchard the great object in view is, of course, the production of fine apples and plenty of them. The neglected, unpruned orchard yields only scrubs, and such an orchard is a constant cause of loss to the owner and an eyesore to the passerby.

Sunshine has a wonderful influence in the formation of fruit buds, as well as in painting with rich color the cheek of the apple exposed to its rays; therefore it is that too much brushwood on a tree may be compared to the weeds in a garden, choking it and making it unproductive.



FIG. 16.—Improper Cutting of a Limb.

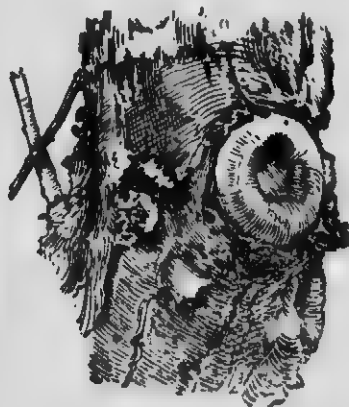


FIG. 17.—Proper Cutting of a Limb.

(Barley)

To thin out all parts of a tree equally needs patient and careful work. It is an easy job to go from tree to tree, cutting out here and there a large limb, and flattering oneself that the orchard is being pruned. But, alas! the work is not done at all; there is simply less of the tree remaining than there was before the cutting. It is quite another thing to go carefully over the bushy tops and thin out the smaller boughs until each one left has room to mature its share of leaves and fruit with full exposure to the enlivening rays of the sun.

The tools needed for pruning are (1) a first-class pruning saw of the best material to keep an edge and to spring back if bent; (2) a pair of tree pruning shears with moderately short handles, which are especially useful in cutting out young wood; and (3) a pair of grape pruning shears for thinning out the

smaller extremities of the branches. With these tools a man will prune a good many trees a day, providing the work is done annually as indeed it should be.

A great mistake is sometimes made by cutting off a'l the fruit spurs along the main branches. An apple tree should bear fruit on all parts of its top, from the trunk to the ends of the outer branches, and some of the best fruit is often borne on fruit spurs growing on the large limbs well down toward the trunk. These spurs can easily be recognized from their slow, drooping habit of growth in distinction from the upright habit of the so-called water sprouts. These latter need not all be removed either, for, if there is an open space, one of them should be allowed to fill it, and, in a year or two, these vigorous young shoots will produce the very finest and largest apples.

Pruning before spraying.—An additional reason for close pruning is found these days in the necessity for spraying. We have fungi and insects both to fight if we would succeed in our work. Now, spraying is not worth much unless every inch of wood is covered with it, but how can one reach every part if the head of the tree is one dense mass of brush; besides, what a waste of time and material there must be if a great quantity of unproductive and useless wood be left to be covered with these expensive mixtures!

The intelligent orchardist, therefore, will begin his pruning these days, by keeping the whole top of his trees from growing beyond the reach of a convenient ladder or of the spray from his spraying apparatus. Then he will carefully thin out all superfluous limbs, such as cross each other or have no room to grow, or will cause too dense a shade over fruit buds beneath them. He will not cut off those twigs that clothe the great interior branches and make all parts of the tree productive, but simply remove a portion of them, even encouraging some of the vigorous shoots above referred to, where there is an open space for them to fill.

The time and expense of spraying will thus be much reduced by thorough and judicious pruning.

CHAPTER XI.

SPRAYING THE APPLE ORCHARD.

Slowly, yet surely, the practice of spraying has become established among fruit growers as one of the prime requisites of successful orcharding. When first introduced, and for some time afterward, the great majority looked upon it with distrust, especially in view of the contradictory reports of results obtained; but, now that spray pumps are so well constructed and spray mixtures so effective, no intelligent apple grower can afford to neglect it.

Proofs of the most definite results, obtained in destroying both insect and fungous enemies of the apple tree, have been reported both from our most successful co-operative associations and from individual owners of large orchards. For example, the *Farmer's Advocate* reports signal success in treating for codling moth and scab an old neglected three-acre orchard near London, Ontario, rented purely for experiment. The Early Harvest apples in this orchard had for years been one-sided, scabby and scrubby and, of course, unsalable. After thorough treatment these Harvest apples were fine, of good form, free of blemishes, and sold at \$1.50 per bushel! As a result, the editor calculates his returns the first year, from his three-acre orchard of fall and winter apples as equalling about 14 per cent. on a valuation of \$1,000 per acre, after deducting all expenses!

Tweedle, of Fruitland, Ontario, reports even better results from several large neglected orchards, which he leased from owners who had little or no returns from them, and which he treated with lime-sulphur for scab and scale, and with arsenate of lead for codling moth.

It is, therefore, evident that proper and timely spraying makes all the difference between success and failure in apple growing.

The outfit.—In large orchards a power outfit is a great labor-saver, and many kinds are on the market; but, for the small orchard, it is more economical to use a first-class hand

pump. With these come hose, extension rod and suitable nozzles. Use a strainer in pouring spray mixtures, which contain lime, into the barrel, lest the small particles clog the nozzles; for this purpose mosquito netting first and afterward a fine gauze wire strainer is useful. The whole outfit should be cleaned before being put aside, or else the poisons will damage the parts.

The length of hose will depend on the place the sprayer stands; if on the ground, 15 or 20 feet; if on the wagon, much less.

At one time clusters of small nozzles were used in order to get a large spread of spray, but, now with improved pumps and of higher power these clusters have been largely supplanted by the large single one which is less liable to clog, and can be adjusted so as to make a wide spray.

One important point to be observed in spraying is to keep up a sufficient pressure, so as to make a very fine spray and to drive it into the parts intended. For this a pressure of 100 lbs. is considered about a minimum; and every pump should be furnished with a gauge to show the pressure employed.

THE SPRAY MIXTURES FOR THE APPLE ORCHARD.

THE LIME-SULPHUR SOLUTION (WINTER STRENGTH).

Quicklime (the best and strictly fresh).....	20 lbs.
Sulphur (flowers)	15 lbs.
Water	40 gals.

To prepare 40 gallons of this spray mixture, put about 13 gallons (or one-third) of the water into a pan or pot, and bring to a boil, and then add the 20 pounds of fresh unslaked lime; then, having first made the 15 pounds of sulphur into a thick paste with boiling water, add this to the lime. Stir occasionally and keep the whole boiling vigorously for at least one hour, then dilute with water to make the 40 gallons. For this hot water is preferable, because, if it is applied hot, the nozzles are less likely to clog, and the spray penetrates crevices the better. If the mixture is left standing so long as to become thoroughly cold, it is best to reboil for a short time in order to bring into solution certain crystals.

The Commercial Lime-Sulphur Solution was first tried by some Canadian fruit growers in 1908 and reported upon so favorably that in many places it is taking the place of the home boiled. It is sold at from \$8.00 to \$12.00 a barrel, is of guaranteed strength, and is usually quite as effective. As a winter spray it should be diluted in the proportion of one part of the solution to ten parts of water. The use of it does away with the disagreeable task of boiling, it is cleaner to handle, does not clog the nozzles, and, since it does not crystallize, will keep any length of time without deterioration.

This is called a winter spray, because it can only be applied when the trees are clear of foliage, usually either in fall or spring when temperature permits; but the most effective time is in May, just before the foliage appears, and when the ground is dry enough to be solid.

Surface says this spray "will destroy, not only San Jose scale, but other insects with which it comes in contact, such as the eggs of the tent caterpillar and the cankerworm, the larvæ of the codling moth in their winter retreats, the bud moth, plant lice eggs, and other pests that are to be found on the tree during winter." It is an excellent fungicide, and is very effective in ridding the orchard of fungous diseases, such as scab, rot, etc.*

The Lime-Sulphur Solution (Summer strength).—For use after the leaves appear, the commercial mixture must be very much weakened. The usual formula is 1 part to 25 of water, but as some brands may be stronger than others, more water may be needed in some cases. Caesar says the proper way to determine the strength is to use a hydrometer, so set as to show when one has sufficient strength in a barrel. He advises 1 part to 30 or 40 gallons of water to be on the safe side.

BORDEAUX MIXTURE.

Copper Sulphate	4 lbs.
Quicklime (fresh)	6 lbs.
Water	40 gals.

Stock solutions of milk of lime and of blue stone, in separate

* A Home-made Concentrated Lime-Sulphur mixture may be made from the following formula: Lime, 60 lbs.; sulphur, 125 lbs.; water, 40 gals. Slake the lime in cooking vessel, stir in sulphur paste, add 40 gallons water and boil one or more hours. Allow time to settle, then draw off the clear, brownish liquid. For use, dilute about one part to nine of water.

barrels, are convenient; one barrel made up of 25 gallons of water in which 25 pounds of fresh lime are gradually slaked; and the other with 25 gallons of water in which 25 pounds of copper sulphate is dissolved. The dissolving will be more rapid if warm water is used and the copper sulphate suspended in a bag just under water. In making up the Bordeaux, 4 gallons of milk of lime and 6 gallons of blue stone solution will give the formula, poured into a barrel having already in it 30 gallons of water; or each may be diluted to 20 gallons first and then poured together into the spray barrel. The milk of lime should be strained lest some gritty particles remain which would clog the nozzle. The stock solutions will keep separately, but after mixing the Bordeaux becomes useless in a day or two.

Previous to 1908 this was the spray chiefly used for fungous diseases of the apple.

KEROSENE EMULSION.

Hard soap	½ pound or soft soap	1 quart
Boiling water (soft)		1 gallon
Coal oil		2 gallons

After dissolving the soap in the boiling water add the coal oil and stir well for 5 or 10 minutes, until an emulsion is formed. This is the stock, which, when using, needs to be diluted with from 9 to 15 parts of water.

WASH FOR BORERS.

First, add soft soap to a saturated solution of washing soda to make a thick paint, then add 1 pint of crude carbolic acid and ½ pound of Paris green to 10 gallons of wash.

To be applied to the trunks of apple trees in early June.

LIME WASH

(For oyster shell bark louse and to clean the trunk.)

Slake 1½ pounds fresh lime in 1 gallon of water. Strain the wash before spraying. To be applied during winter, after scraping off the rough bark.

ARSENATE OF LEAD

(For Codling Moth.)

2 pounds of arsenate of lead.
40 gallons of water.

Use a little water and rub the arsenate into a thin paste before putting it into the spray tank. Begin using as soon as two-thirds of the blossoms have fallen and before the fruit turns downward.

Where Bordeaux, or the lime-sulphur (summer solution), is being used for scab, this may be added to it, in proportions of two pounds to 40 gallons.

The arsenate of lead may be used in stronger solution than other arsenical poisons without injuring the foliage, so that with insects hard to poison three, or even four, pounds may be safely used to 40 gallons of water.

A general rule for the application of sprays may be given as follows:

For leafeaters, such as tent caterpillars, cankerworms, etc., spray, soon after the leaves unfold, with the arsenate of lead.

For fungi, such as scab and leaf spot, use Bordeaux or lime-sulphur (1) just before blossoms open, (2) just after blossoms fall.

For sucking insects, such as scale, plant lice, etc., spray twice with kerosene emulsion (1 part to 10 of water) (1), as leaves are unfolding, and (2) about ten days later; or, with lime-sulphur (winter strength), before the leaf buds open.

For borers, a wash of soft soap, applied on the trunk early in June, and perhaps again in July, should be sufficient to prevent the mother beetle from depositing its eggs in the bark. If, however, the borer is already established, it must be first dug out with a sharp knife or an awl.

Two important sprayings for the apple orchard are of the greatest importance, and must on no account be omitted, viz.:

(1) In May, when buds are swelling out and before they burst, the lime-sulphur, 1 part to 10 of water, to clear the trees of scale, aphid eggs, fungi, etc.

(2) Immediately after the fall of the blossoms, or even before all the bloom is shed in case there is a large orchard to be treated, lime-sulphur, one gallon to 30 or 40 of water, for scab; and with two pounds arsenate of lead added to control codling moth.

The addition of lime paste to these sprays enables one to judge better of the thoroughness of the work.

CHAPTER XII.

THINNING APPLES.

The thinning of the fruit of the apple tree has not been shown to be as profitable as in the case of the peach. Indeed, it is a question whether in the case of high standard trees it pays for the time and trouble, unless the fruit is very high priced.

At Geneva, N.Y., three methods were tried, viz., (1) removing all inferior or defective specimens, and reducing all clusters to one fruit; (2) the same, but leaving the fruits at least four inches apart, and (3) the same but six inches apart. These experiments seemed to indicate that the second was the best method of thinning apples. The best results were from trees thinned about the end of June. Hall gives the following as fair conclusions:

"The operation of thinning apples will cost less than 50 cents a tree, and may, to a slight degree, reduce the expense of harvesting the fruit.

"It will, if crops are heavy, add from 10 to 15 per cent. to the intrinsic value of the fruit by increasing the size, by improving the quality and by brightening the colors.

"It will probably decrease the total amount of salable apples, this decrease coming principally in the amount of second grade fruit.

"It will not, on mature, well-established trees, materially influence the regularity of production or the amount of fruit setting for subsequent crops. The profit, if there be any, must come from the crop thinned.

"It will, if judiciously applied, protect young trees from weakness through overbearing; and will lessen the loss from broken branches and splitting of mature trees.

"Whether or not it will be a paying operation will depend on market possibilities. Where near a market that will respond with extra prices for extra quality, the grower of apples could probably thin with good financial results, either directly or by establishing a reputation for fine fruit."

French, speaking before the Ontario Fruit Growers, said:

"The result of judicious thinning is larger fruit, of more uniform size, and higher color resulting in increased value of crops. Thinning encourages annual bearing, lessens the number of seeds to be matured and thus prevents waste of fertility.

"I thin soon after the June drop. If trees are heavily laden it is better to thin twice, allowing three weeks between thinnings. Remove about one-fourth of the crop each time. I snip the apples off with the thumb-nail, first taking imperfect and then the smaller ones. Where fruit is in clusters, thin here severely, thereby distributing load evenly over whole tree. I work around tree on a ladder and keep two boys in centre and two around base on step ladders. We remove as much fruit as five good pickers will pick in the fall in the same time when wages are dearer.

"By removing one-half of the apples in the summer I reduce the fall picking one-third. This enables me to let all the fruit get thoroughly ripe before gathering it.

"During the season of 1907, I thinned 100 trees in an orchard of 200. When I compared results I found by removing one-half crop on heavily loaded trees, that on the average I had doubled the quantity of No. 1's with very few culls.

"The varieties that I had best results with, were Snow, Wagener and Northern Spy; but all varieties which load heavily require thinning. I also found that as a result of thinning the bulk was not diminished.

"Where trees have only a light crop remove what will be culls and poor No. 1's. *This year's experience on heavily laden trees has fully convinced me that thinning is as necessary as cultivation, fertilizing, pruning or spraying of the orchard.*"

J. J. Gilberton, of the Norfolk Fruit Growers' Association, gives his experience in thinning apples, as follows:

"Ladders, step-ladders and intelligent men are all that are required in thinning fruit on the tree. As a general rule, it is well to take off all small and deformed apples. It is inadvisable to leave more than two apples together, and, if the tree be heavily laden, thin to one.

"On July 7th. last year, I commenced to thin Greenings, and continued on Holland Pippins, Alexanders and Baldwins. When the fall apples are about the size of walnuts, they may be thinned. Thinning Spys before last of July is not recommended but afterwards it may be proceeded with until harvest.

"In 1908, this work, on my entire orchard of Greenings, Baldwins, Kings, Golden Russets, Spys, and a few other varieties, effected a uniformity of size in the ripened crop that facilitated packing in boxes, a method certain of adoption in the near future, for it is only thus that we will be enabled to receive the highest market price, and prove our boxed apples equal to those of British Columbia and Oregon.

"By thinning, the buds for the following year are benefited by the nourishment which has not been uselessly absorbed by unsalable fruit. Proper modes of fertilizing, thinning, spraying, cultivating and pruning cannot but produce apples fine enough for the world's competition.

"In thinning ordinary-sized trees, which are about two-thirds loaded, a man could thin from ten to fifteen trees per day. In case of an unusually large tree being overloaded, a man would need to spend about one-half day in removing the small and deformed apples.

"In breaking the stem, one may use the same method as in picking in the fall, and avoid injury to the fruit buds for the succeeding year. There is very little danger of injuring the fruit buds in thinning, the only danger being in the placing of ladders, and a person moving about in the tree, when he is liable to break the fruit-spurs.

"Although I found the expense of thinning in 1908 averaged 5 cents per barrel of fruit harvested, the cost of picking and packing was reduced, in not having to pay for the handling of small and inferior fruit.

"A large, overloaded tree, if not thinned, would probably produce about four barrels of firsts, but if thinned, would very likely yield eight or more, thus almost doubling the profit, after paying a man 75 cents for thinning it. My entire crop of eight hundred and eighty barrels were picked and packed for 20 cents per barrel, and, including the cost of thinning, was handled much cheaper than in the previous year.

"From this method, adopted for the first time in 1908, I reached results otherwise unobtainable. Only 7 per cent. were graded seconds, while 93 per cent. ranked as firsts.

"Therefore, in conclusion, my advice to the fruit growers of Ontario is to thin apples, peaches, and, in fact, all fruit where trees or vines are overloaded."

CHAPTER XIII.

HARVESTING APPLES.

The growing and the harvesting of apples is recognized in many parts of the Dominion as a natural and proper part of mixed farming. Almost every farmer, even in some quite northerly districts, has a small orchard of perhaps one hundred or two hundred trees; while, in sections more favorable to this industry, an apple orchard, ten or twenty acres in extent, is not at all uncommon.

The fact is that the crop of winter apples comes in when the farmer has finished his grain harvest and is at comparative leisure, so that his apple crop is an extra source of revenue, and often, indeed, no inconsiderable portion of it.

Summer apples cannot be gathered as economically as fall or winter apples, because they ripen more unevenly. The Astracan, for example, needs to be in the perfection of its dark, rich red in order to catch the eye of the buyer; and, therefore, the trees need going over about twice a week, for two or three weeks, in order to get them at their best. Much the same is true of Duchess, Alexander, Gravenstein and others.

Fall and winter apples ripen more evenly, and anyway hang longer after full maturity, so that it is customary to gather them all at one picking.

The work of apple picking is usually done from a ladder, several sizes of which are required according to the height of the trees. Some trees, however, are so high as to be beyond the reach of any ladder, owing to a common mistake of never heading back a tree in the pruning. No tree should be allowed to grow upward beyond the reach of a twenty-foot ladder; though, alas! for the picker and the sprayer, many of them, in such rich soil as is found in the Niagara District of Ontario cannot be reached by a thirty-foot one.

A little knack in balancing a ladder will enable a man to handle and move even a long one from tree to tree without help; but a greenhorn will soon lose control of the balance and let his



FIG. 18 - PICKING AND PACKING APPLES IN AN OUTSIDE CARD

Illustration

ladder fall to the ground and break in pieces. In the Province of Ontario, where lumber is not too scarce, good ladders with sides of pine, or some other light wood, and rounds of hickory, may be purchased nowadays at from 12 to 15 cents a foot, and these should always be provided well in advance of the fruit season.

The use of a grain bag, tied together at the corners and slung over the shoulders, which is often recommended, may be useful when climbing a tree, but is an antiquated affair when the fruit is gathered by one standing on a ladder. A round



FIG. 19.—Apple Picking Basket.

swing handle basket, lined with old carpeting, and having a stout wire hook convenient for suspending it from the rounds of a ladder, or from a limb, is the best receptacle for apples when picking the main crop.

In the case of winter apples the basket is emptied into barrels on a dray, and these are at once taken and set under cover in the packing shed; but, for summer apples the common eleven-quart fruit basket is most convenient.

for, having these in quantity, they can be filled directly from the tree, and placed upon the dray and thence set down in the packing house, without any handling of the fruit which is often too tender for dumping.

Picking apples from the trees by hand is at best rather a slow operation and a serious charge against the profits. Where the trees are well laden women and boys may be employed to pick by the barrel or bushel box, at, say, 10 cents a barrel or 3 cents a box, or a little more if the trees have a thin yield. It is best, as a rule, not to fill the boxes quite level full in order to permit of their being piled on one another five or six high in the packing shed. In case of a heavy yield a man should be able to pick from 10 to 15 barrels in ten hours, and thus make fairly good money, while, at the same time, when picking by the box or barrel, he can make good use of the other members of his family. From trees badly pruned and allowed to reach far up into the sky, the apple picking will prove quite a different proposition, especially in case of a short crop necessitating several times mounting the ladder for a basket full. In this case, the

only way possible is to engage men by the day who can be trusted to do faithful work.

The handling of the apples is very important. Careless pickers will drop them into the baskets as if they were so many stones, when, in fact, every little bruise is a thrust at the beauty, and consequently at the selling value of the fruit.

The common practice of piling high grade apples in great heaps throughout the orchard is to be avoided except under the most favorable circumstances. Sometimes the hot sun will burn the exposed side, or, later, Jack Frost may nip it, or the rains or snows of November may seriously delay the packing. Besides, if handled at all wet, little particles of dust cling to the skin giving it, even after drying, a dull, mussy, unattractive exterior. Then, again, orchard piles call for orchard packing, and the exposure of barrels or boxes to all kinds of weather is much to their injury, breaking the hoops and warping the heads.

Nor is it much more costly to store the apples under cover, for the low-wheeled dray, which carries the men with baskets and ladders to the orchard, can also carry out the empty barrels ready to be filled as they stand upon the dray, and to be drawn to cover as fast as ready.

The barrels should have their heads removed before being taken out to the orchard for the apple pickers. These heads are easily mixed, in which case it is worse than a Chinese puzzle to fit them together; therefore, as taken out they should be laid carefully in a barrel set aside in the packing-house for the purpose, each head crossing the last to avoid any possibility of mixing the parts when they are needed. The hoops of the barrels should be tightened with mallet and wooden cooper's chisel, and a small nail driven in each outer quarter hoop on each side of the barrel. The end left in will be the head when packed, so this may as well be "headlined" at once with a strip on each side, across the head pieces, held with three shingle nails. If this is properly done, nails through the top hoops into the ends are unnecessary, besides they are very troublesome to the salesman when opening sample barrels.

Bushel boxes are still more convenient than barrels for use in bringing the apples under cover. If in large supply these when filled can be piled several deep in the packing house, the kinds of apples in separate stacks. They are more convenient than barrels for they can be much more easily lifted to pour out

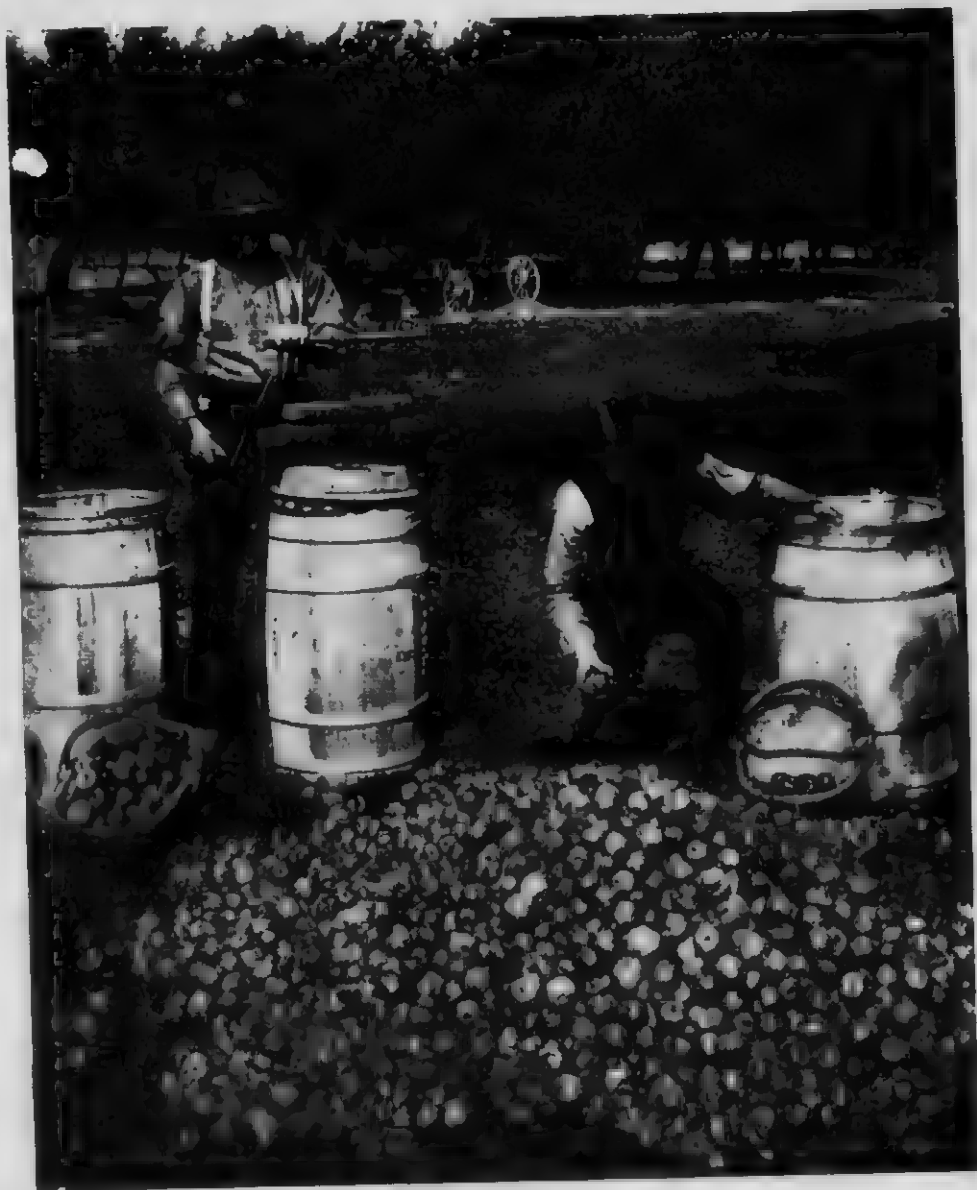


FIG. 1. PACKING APPLES FROM PILES IN THE ORCHARD

the apples upon the packing table, and, if necessary can be handled by women packers.

The apple pickers should be disposed in the orchard after some plan, or several will congregate in one small tree for mutual good fellowship and gossip. A good way, in a large orchard, is to have a gang consist of eight men, taking four rows of trees, two men to each row. In this way each man picks half a tree, more or less, and the dray passing down between the second and third rows, is not far away from any one of them.

Scrubby fruit, if such has been left upon the trees until the apple harvest, should not be put in the basket, because to do so makes double work, putting it in and then sorting it out again when packing. The intelligent picker will either leave such scabby and gnarly apples untouched, or pull them and drop them to the ground.

Work on one variety at a time is a good rule in picking apples, where convenient, and the kinds should be gathered in order, as they seem nearest maturity. The McIntosh and the Fameuse and the Wealthy, for example, mature early and need to be gathered as soon as well colored; while Baldwin and Spy will hold longer upon the trees without dropping. In a cultivated orchard, the fruit usually holds longer on the tree than in one on the sod.

Orchard packing may be advisable sometimes, when the orchard is in blocks of one variety and the crops heavy and prices so low that every economy in handling must be exercised. In that case the pickers empty their baskets directly upon the packing table, and the work is all completed with one handling, as in our illustration (Fig. 18), showing apple picking and packing in an Ontario orchard. Obviously it would be almost impracticable to make more than one grade in this way. The culls and No. 3's are simply thrown out upon the ground for disposal later.

Or, if the apples are going into an apple house to be culled over and packed during the winter, the barrels are filled rapidly from the packing table, simply throwing out the culls, and headed temporarily without nails.

CHAPTER XIV.

PACKAGES FOR APPLES.

The barrel.—For the main crop of winter apples, particularly for grade No. 2, no package is so suitable as the barrel. At best the apple crop is very bulky, and ordinary grades should be put up in the largest package available which can be easily handled, and, in this respect, nothing has ever been invented so wonderfully convenient. It is easily opened and closed, and, though weighing 150 pounds, more or less, when filled, can be rolled about, and even lifted by one man, as no square-cornered package of the same weight could be.

In Nova Scotia the American 96-quart apple barrel has long been in use, but in Ontario and Quebec the flour barrel size was used by all apple growers previous to the year 1901, when, for the sake of uniformity, a Dominion Act was passed regulating the size of fruit packages in general and adopting the 96-quart barrel (Imperial measure) as the minimum legal size of an apple barrel. This latter is gradually being adopted by growers and shippers of apples throughout the Dominion.

Dimensions.—The flour barrel, still used in some parts of Ontario, has dimensions as follows:

Between heads	27½ inches
Head diameter	17 inches
Middle diameter	19½ inches

The apple barrel, legalized by the Fruit Marks Act, now known as "The Inspection and Sale Act," and which is now the standard size, has the following dimensions:

Between heads	26¼ inches
Head diameter	17 inches
Middle diameter	18½ inches

These are the minimum measurements, but, of course, there is nothing to prevent the use of a larger size.

There should be 16 staves to a barrel, varying from ½ to ¾

jointing, absolute uniformity being difficult to secure. A first-class barrel should have sound staves, $\frac{1}{8}$ inch jointing, cut 5 to 2 inches, but averaging 4 inches in width at the bilge, and free from large knots. The head should be not less than half an inch thick, dressed, clear and sound. The hoops should be $\frac{1}{2}$ inch on the thin side, and $\frac{3}{4}$ inch on the other in thickness, by $1\frac{3}{4}$ inch in width, and eight in number.

A home cooper shop.—Some co-operative associations are finding it an advantage to put in a cooper's outfit and have their barrels made up at home. McNeill says: "A serviceable outfit will not cost more than \$50.00 to \$75.00, and any vacant outbuilding can be very readily fitted up for barrel making. But the better way is to train the ordinary help on the farm so that they can work at these barrels during the winter months and other times when work is slack. Any handy man with slight instruction can soon learn to make an apple barrel for all practical purposes as good as the best.

"There are several advantages in making the barrels at home. Stock for barrel making can be bought early in the season and is easily stored in this shape without taking harm. The price, therefore, is usually a third less than when an order has to be placed hurriedly with a cooper. Not only is the price less, but the chances of being left without a stock of packages is minimized. Perhaps a more important inducement for making barrels at home would be that labor would be employed on the farm, so as to make it possible to retain men the year round."

The box.—For fancy stock, and even for grade No. 1, the bushel box is becoming every year more and more generally adopted. Indeed in British Columbia, the box is almost the only package used for apples. There is much to be said in its favor. It is a convenient package for the retailer to handle, for he can sell a box without breaking the package, while a barrel often has to be measured out in half bushels; and it is an old saying that "the better the grade the smaller the package."

Size.—Regarding the exact size of the apple box for adoption in Canada as the standard there was much difference of opinion, but, after very extended discussions at the meetings of the Ontario Fruit Growers' Association and careful comparison of the various sizes adopted by various apple producing countries, it was agreed by representatives from the several provinces to recommend to the Dominion Minister of Agriculture the fol-

lowing as the measurements most desirable for adoption in Canada, viz., 20 inches long by 11 wide and 10 deep, inside measure, and holding 2,200 cubic inches; and this is the same size as the box used by Tasmania apple growers in their shipments to Great Britain. These boxes can be had from a box factory at from 14 to 16 cents each.

The following thickness of the parts is recommended: End pieces, $\frac{5}{8}$ to $\frac{3}{4}$ inch; sides, $\frac{3}{4}$ inch; top and bottom, $\frac{1}{4}$ inch.

These should be put together with waxed nails, and not dove-tailed for this does not hold strongly enough for apple



FIG. 1. THE BASKET IN USE FOR LOCAL SHIPMENTS IN ONTARIO

shipping. If well made, there will be no need to use either wire or hoop iron bands, even for export.

Cleats should be used in nailing on the top, for this not only makes it more secure but also serves to insure circulation of air when the boxes are piled together on car and shipboard.

The basket.—For No. 1 summer apples, going to near markets, and gathered in the height of color, the eleven-quart peach basket with handle, so widely used in Ontario, is very convenient; but for distant shipments, of course, the basket must always give place to the box.

CHAPTER XV.

GRADING AND PACKING APPLES.

A **packing table** is a great saver of time, where there is a large orchard and any considerable quantity of apples to be assorted and packed (Fig. 22). The one used by the writer for many years with great satisfaction has the following dimensions:

Length, 80 inches.
Breadth, 40 inches.
Height at front, 32 inches.
Height at back, 40 inches.
Height of side boards, 6 inches.

The front is provided with an apron of coarse sacking, tacked fast underneath, for use in letting down the apples to the bottom of the barrel to prevent bruising.

The capacity of this table permits of six or eight bushels of apples being dumped upon it at one time and being quickly run into barrels. A sorter, standing on the side, takes out the No. 1 apples and the barrel packer, stand-

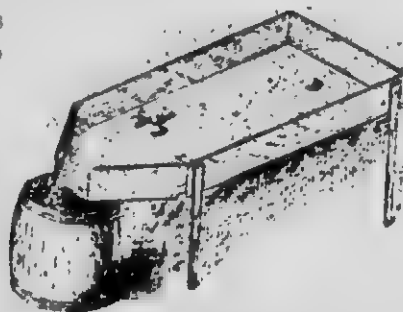


FIG. 22.—Packing Table

ing in front, simply throws out the culls as the apples roll along out of the opening down into his barrel. (Fig. 23.)

Where No. 1 apples are packed in boxes the fruit put in barrels would be grade No. 2, which is the lowest grade worth shipping any distance; unless, in exceptional cases, where the demand is very keen, and, because of overbearing, the apples run below medium size, or, for some other reason, a large quantity of apples, even with the culls taken out, would make a doubtful No. 2. In such case it may sometimes be advisable to pack a good No. 3 to be sold on its merits, rather than to attempt

to select out the No. 2 and try to make two grades. It is expensive work to make too many grades and it is confusing to the packers; therefore, unless the crop clearly warrants it, there is no advantage to be gained by it.

Packers.—Three persons make a convenient gang to work together at this packing table, one man to empty the boxes or barrels on the table, to lay the barrels ready for filling, and to stand over them as the No. 2 apples roll in, throwing out the culls (Fig. 23). Two men, or two women, one on each side of the table, will take off into boxes or baskets all the fancy, or the No. 1 grade, as they roll down toward the opening into the barrel. These selected apples are set to one side for packing in



FIG. 23.—Using a Packing Table in a Canadian Orchard. Picking, Packing and Heading-up all being completed.

boxes. In addition to these, one man may be needed for heading up the barrels or boxes, when filled, and for putting on them the proper marks.

Grades.—Previous to the passing of the Fruit Marks Act of 1901, grade marks were almost useless in making sales of apples in closed packages, for every packer attached his own meaning to his marks, and the buyer could have no confidence in a pack until he had turned out several samples. The result was a common price for nearly all barreled apples, the better stock being discounted by the poorer. Fortunately for the trade the resolutions presented by the Ontario Fruit Growers' Association, backed up by the approval of the British Columbia, the

Quebec and Nova Scotia Associations, were approved by the Dominion Minister of Agriculture, the Hon. Sidney Fisher, who introduced a bill into the House of Commons which was known as the Fruit Marks Act. At first it met with considerable opposition, but was finally passed, and has since met with almost universal approval.

For convenience of reference we give here a complete copy of this Act as amended in 1902 and in 1906, and now known as

"THE INSPECTION AND SALE ACT, PART IX."

INTERPRETATION.

319. In this part, unless the context otherwise requires:
- (a) "Closed package" means a box or barrel of which the contents cannot be seen or inspected, when such package is closed;
 - (b) Fruit shall not include wild fruit, nor cranberries, whether wild or cultivated;
 - (c) "Culls shall include fruit that is either very small for the variety, or immature, or the skin of which is broken so as to expose the tissue beneath, or that is so injured by insects, fungi, abnormal growths, or other causes as to render it unmerchantable

THE MARKING OF FRUIT

320. Every person who by himself or through the agency of another person packs fruit in a closed package, intended for sale, shall cause the package to be marked in a plain and indelible manner, in letters not less than half an inch in length, before it is taken from the premises where it is packed:

- (a) With the initials of his Christian names and his full surname and address, or, in the case of a firm or corporation, with the firm or corporate name and address;
- (b) With the name of the variety or varieties; and
- (c) With the designation of the grade of fruit, which shall include one of the four following marks, viz.: Fancy, No. 1, No. 2, No. 3.

2. Such mark may be accompanied by any other designation of grade or brand, if that designation or brand is not inconsistent with, or marked more conspicuously than, the one of the said four marks which is used on the said package

321. No person shall sell, or offer, expose or have in his possession for sale, any fruit packed:

- (a) In a closed package and intended for sale, unless such package is marked as required by the provisions of this Part;
- (b) In a closed package, upon which package is marked any designation which represents such fruit as of
 - (i) Fancy quality, unless such fruit consists of well-grown specimens of one variety, sound, of uniform and of at least normal size, and of good color for the variety, of normal shape, free from worm holes, bruises, scab and other defects, and properly packed

- (ii) No. 1 quality, unless such fruit consists of well-grown specimens of one variety, sound, of not less than medium size and of good color for the variety, of normal shape, and not less than ninety per centum free from scab, worm holes, bruises and other defects, and properly packed.
- (iii) No. 2 quality, unless such fruit includes no culls and consists of specimens of not less than nearly medium size for the variety, and not less than eighty per cent. free from worm holes and such other defects as cause material waste, and properly packed.
- (c) In any package in which the faced or shown surface gives a false representation of the contents of such package; and it shall be considered a false representation when more than fifteen per centum of such fruit is substantially smaller in size than, or inferior in grade to, or different in variety from, the faced or shown surface of package

BRANDING "FALSELY MARKED" AND "FALSELY PACKED."

322. Whenever any fruit in any package is found to be so packed that the faced or shown surface gives a false representation of the contents of the package, any inspector charged with the enforcement of this Part may mark the words "Falsely packed" in a plain and indelible manner on the package.

2. Whenever any fruit packed in a closed package is found to be falsely marked, the said inspector may efface such false marks and mark the words "Falsely marked" in a plain and indelible manner on the package.

3. The inspector shall give notice, by letter or telegram, to the packer whose name is marked on the package, within twenty-four hours after he marks the words "Falsely packed" or "Falsely marked" on the package.

FRUIT PACKAGES.

325. All apples packed in Canada for export for sale by the barrel in closed barrels shall be packed in good and strong barrels of seasoned wood having dimensions not less than the following, namely: Twenty-six inches and one-fourth between the heads inside measure, and a head diameter of seventeen inches, and a middle diameter of eighteen inches and one-half, representing as nearly as possible ninety-six quarts.

2. When apples, pears or quinces are sold by the barrel as a measure of capacity, such barrel shall not be of lesser dimensions than those specified in this section.

3. When apples are packed in Canada for export for sale by the box, they shall be packed in good and strong boxes of seasoned wood, the inside dimensions of which shall not be less than ten inches in depth, eleven inches in width and twenty inches in length, representing as nearly as possible two thousand two hundred cubic inches.

4. When apples are packed in boxes or barrels having tray or fillers wherein it is intended to have a separate compartment for each apple, the provisions of this section as to boxes and barrels shall not apply.

326. Every box of berries or currants offered for sale, and every berry box manufactured and offered for sale, in Canada shall be plainly marked on the side of the box, in black letters at least half an inch square, with the word "Short," unless it contains when level-full as nearly exactly as practicable:

- (a) At least four-fifths of a quart; or,
- (b) Two-fifths of a quart.

2. Every basket of fruit offered for sale in Canada, unless stamped on the side plainly in black letters, at least three-quarters of an inch deep and wide, with the word "Quart" in full, preceded with the minimum number of quarts, omitting fractions, which the basket will hold when level-full, shall contain, when level-full, one or other of the following quantities:

- (a) Fifteen quarts or more;
- (b) Eleven quarts, and be five and three-fourths inches deep perpendicularly, eighteen and three-fourths inches in length and eight inches in width at the top of the basket, sixteen and three-fourths inches in length and six and seven-eighths inches in width at the bottom of the basket, as nearly exactly as practicable, all measurements to be inside of the veneer proper and not to include the top band.
- (c) Six quarts, and be four and one-half inches deep perpendicularly, fifteen and three-eighths inches in length and seven inches in width at the top of the basket, thirteen and one-half inches in length and five and seven-eighths inches in width at the bottom of the basket, as nearly exactly as practicable, all measurements to be inside of the veneer proper and not to include the topband: Provided that the Governor in Council may by proclamation exempt any province from the operation of this section.
- (d) Two and two-fifths quarts, as nearly exactly as practicable.

INSPECTOR'S RIGHT TO EXAMINE.

327 Any person charged with the enforcement of this Part may enter upon any premises to make examination of any packages of fruit suspected of being falsely marked or packed in violation of any of the provisions of this Part, whether such packages are on the premises of the owner, or on other premises, or in the possession of a railway or steamship company.

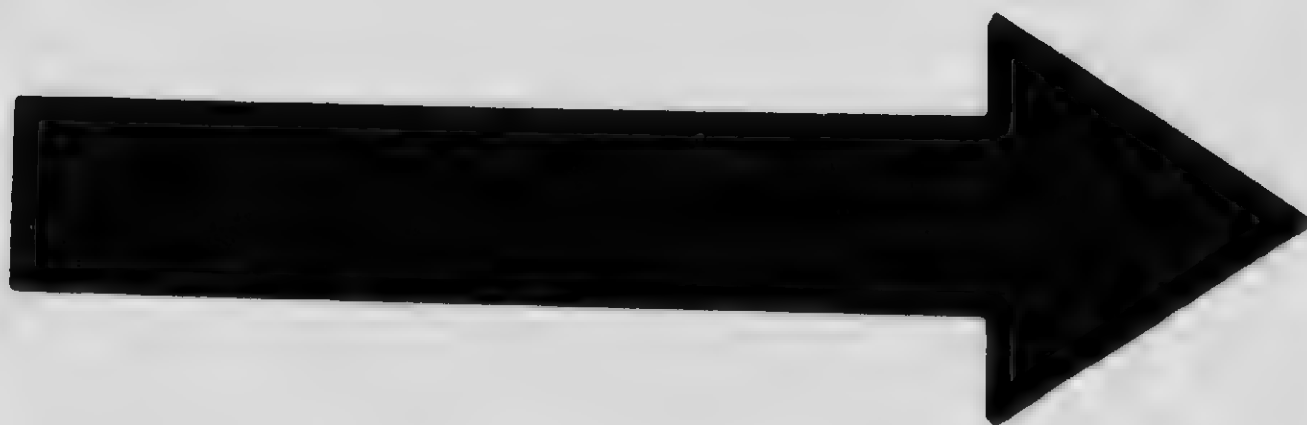
PENALTIES.

328. Every person who, by himself or through the agency of any other person, violates any of the provisions of sections 320 and 321 of this Act, shall be liable, for the first offence, to a fine not exceeding \$25 and not less than \$10; for the second offence, to a fine not exceeding \$50 and not less than \$25; and for the third and each subsequent offence, to a fine not exceeding \$200 and not less than \$50, together, in all cases, with the costs of prosecution; and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labor, for a term not exceeding one month, unless such fine and costs, and the costs of enforcing them, are sooner paid.

2 Whenever any such violation is with respect to a lot or shipment consisting of fifty or more closed packages, there may be imposed, in addition to any penalty provided by this section, for the first offence twenty-five cents, for the second offence fifty cents, and for the third and each subsequent offence one dollar for each closed package in excess of fifty with respect to which such violation is committed.

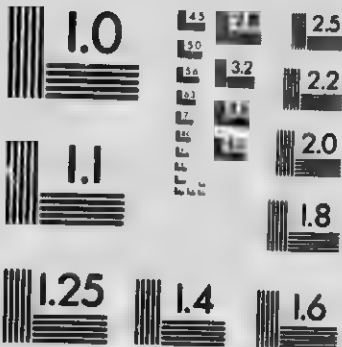
TAMPERING WITH MARKS.

329. Every person who, not being an inspector, wilfully alters, effaces, or obliterates, wholly or partially, or causes to be altered, effaced, or obliterated, any marks on any package which has undergone inspection, shall incur a penalty of forty dollars.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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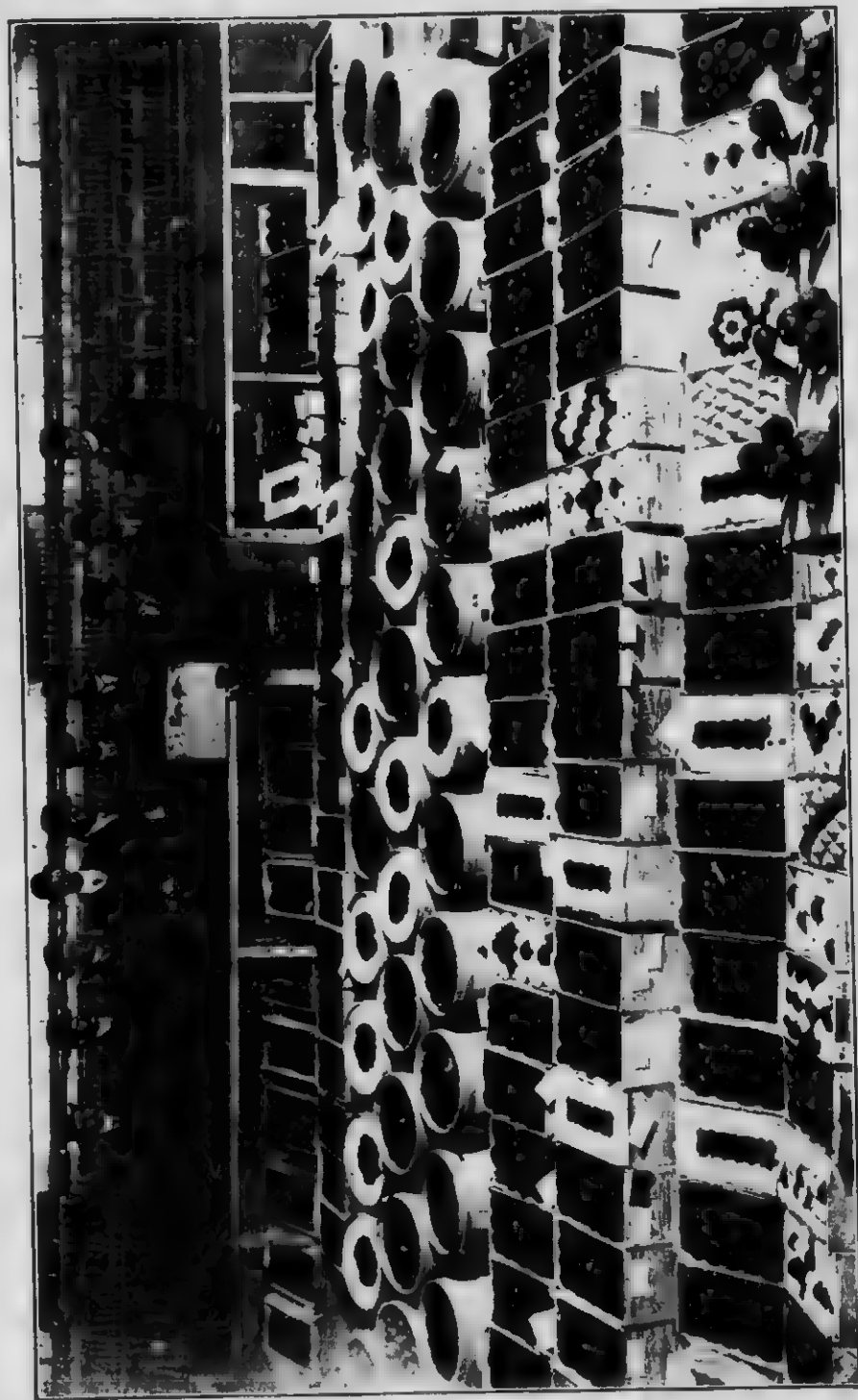


FIG. 24.—EXHIBIT OF APPLES PACKED IN BOXES AND BARRELS AT THE ONTARIO HORTICULTURAL EXHIBITION, TORONTO, 1908.

OFFENCES AND PENALTIES.

330. Every person who offers or exposes for sale, or who packs for exportation, apples, pears or quinces, by the barrel or box otherwise than in accordance with the foregoing provisions of this Part, shall be liable, on summary conviction, to a penalty of twenty-five cents for each barrel or box of apples, pears or quinces so offered or exposed for sale or packed.

2. Every person who, for export, offers or exposes for sale or packs, apples by the box otherwise than in accordance with the foregoing provisions of this Part, shall be liable, on summary conviction, to a penalty of twenty-five cents for each box of apples so offered or exposed for sale or packed.

331. Every person who neglects to comply with any of the provisions of this Part relating to boxes of berries, or currants, or berry boxes, or baskets of fruit, or who sells or offers for sale any fruit or berry boxes in contravention of any of the said provisions, shall be liable, on summary conviction, to a fine of not less than 25 cents for each basket or box so sold or offered for sale.

332. Every person who obstructs any person charged with the enforcement of this Part in entering any premises to make examination of any packages of fruit as provided by this Part, or who refuses to permit the making of any such examination, shall be liable to a penalty not exceeding five hundred dollars and not less than twenty-five dollars, together with the costs of prosecution, and in default of payment of such penalty and costs, shall be liable to imprisonment, with or without hard labor, for a term not exceeding six months, unless such penalty and costs and the costs of enforcing the same are sooner paid.

333. The person on whose behalf any fruit is packed, sold, offered, or had in possession for sale, contrary to the provisions of the foregoing sections of this Part, shall be prima facie liable for the violation of this Part.

Then follow certain regulations, instructions and explanations for inspectors, and explanatory notes, which may be omitted from this work, but may be had on application to the Department of Agriculture at Ottawa.

Packing the barrel.—In packing the barrel average samples of good color are selected and placed to cover the bottom, which will be the head, with stem end down beginning with a row all around against the side; then, a second layer is placed in the same way, but so as to cover the openings between the apples of the first layer, after which they may be allowed to go in freely from the packing table. Some careful packers remove the stems of the first layer with pincers lest they press into the flesh and injure it. For high grade apples a fine effect may be had by first lining the head with lace paper before beginning to pack the barrel. (Fig. 25.)

The packer will take care to give the barrel an occasional shake during the filling and often pack the apples in their places by hand to make them lie close. With care in these particulars

it will not be necessary to fill the barrel more than about an inch or two above the chime so that a gentle pressure with the apple press will bring the head to its place without bruising the fruit. Carelessness in this particular has often depreciated the value of the fruit one-third. Some packers use a paper pad at each end of the barrel to relieve the apples of the direct pressure.

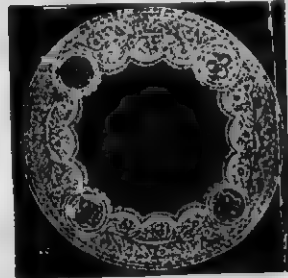


FIG. 25.—Lace Paper Head Lining for Apple Barrels.



FIG. 26.—Screw Press for Heading Apple Barrels.

Several styles of presses are offered for sale for use in heading barrels. The lever press, which is operated and held in place by the foot, is quick and convenient; but some packers prefer the screw press, which holds the head in place without effort. (Fig. 26.) With this an iron circle press head is used, or a press block of heavy wood resting upon the barrel head.

A cooper's mallet and wooden chisel should be used in driving down the hoops to their places, after which the press is removed and the head lining placed as previously described.

The barrel should then be at once turned down side up, and the name of the variety and the grade plainly stamped upon it, leaving room for the shipping mark and the name of the shipper.

Packing the box.—For fancy apples and for highly colored No. 1, the box is the most suitable package, particularly where it can be sold on order. Very choice grades for export should have each apple wrapped in tissue or in thin Manilla paper; but for near markets it may suffice to wrap only those layers coming next

the wood. Paper for this purpose may be purchased in quantity from the paper mills or from the wholesale warehouse, because this is a specialty not furnished by retail shops. The writer has purchased wrappers already cut to 10 x 10 inches, a convenient size for apples, at 20 cents per

1,000 squares. Fancy printed wrappers, similar to those used in orange packing, printed with the name and brand, and put up in colors, can be had for special houses at about twice that price; but for ordinary sales, economy in the packing expenses is good policy.

The wrapping is quickly done. With one hand the packer takes up an apple from the packing bench, and with the other a square of paper placing it against the calyx end; a twist of the paper about the stem does the work and the apple is put at once in its place in the box. Thus one handling does the grading to uniform size, the rejecting of any unfit samples overlooked at the sorting table, the wrapping and the packing in the box. Great loss of time is made where these are done separately, one person grading, one wrapping and another packing, for it would require three times handling of each apple instead of once.

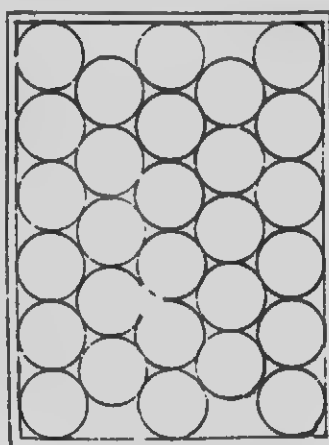
The writer uses a packing bench sloping toward him, eight or ten feet long and about two and a half feet wide, with sides about three inches high all around. There are two slides on the lower side, one about a foot from each end, for convenience in cleaning the table or in emptying rejected apples. This table will accommodate two box packers, and on it the fancy apples are placed, after being selected out from those on the barrel packing table, previously described.

Usually the bushel box will pack four apples across lying flat, and seven lengthwise, making twenty-eight in a tier, and four tiers, or 112 apples in all; but, if the apples are very large, they would go only four across on their edges and three tiers, or 84 apples; while sometimes large Kings would only go three across, lying flat and six lengthwise, and three tiers, or 64 in all. There are various other ways of rowing used in the West where

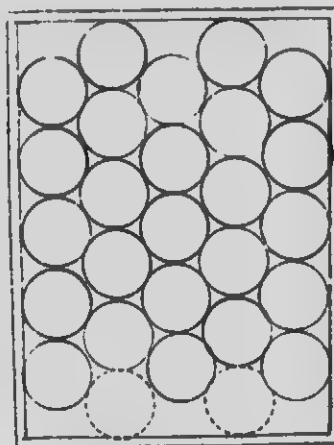


FIG. 27.—A Box of Packed Apples.

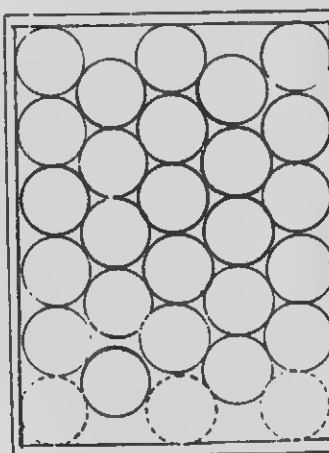
box packing is universal, as the straight, the alternate, the diagonal, etc. A little practice will enable the packer to know which method of rowing is best adapted to the various sizes of apples he is handling.



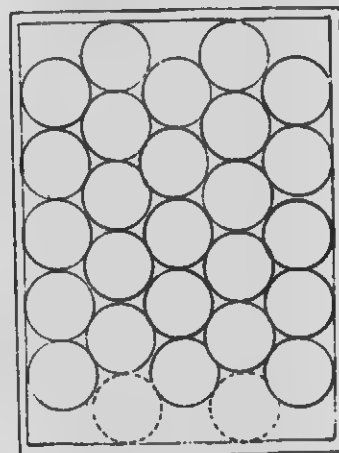
First Tier of Apples in Box



Second Tier in Same Box



Next or Third Tier



Top or Fourth Tier

FIG. 28.—HOW TO PLACE APPLES IN BOX FOR THE 110 SIZE.

Boies, in *Canadian Horticulturist*, gives accompanying figures to show the British Columbia method of placing apples in a box, for size that would require 110 apples: "The size is

determined and placed, one at a time, starting at the end of the case next to the packer, with one apple in each corner of the box and one in the space half way between. Next, place two, one in each space. Now we have five. In the three spaces place 1—1—1; next —1—1—, and so forth until the first tier of 28 apples is complete. For the next tier begin with —1—1—, next 1—1—1; this placement must be in the "holes" between the first three placed in the box; and continuing two—three, two—three, until completed with 27 apples; and so on with the third and fourth tiers. The last two or three apples in each tier, will bind the whole firmly.

As a rule, no packing material will be needed in the case of

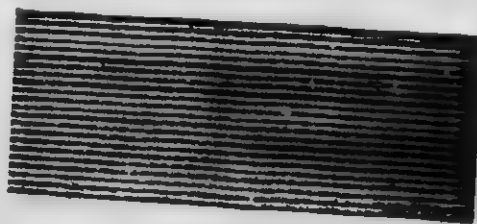


FIG. 29.—Corrugated Packing Paper.

wrapped apples; but, if required, a little fine wood shavings, in the form usually sold as excelsior, is very convenient to use when nailing on the bottoms, and may be purchased in bales of about 100 lbs. each for about 1 cent a pound or a little more; or the corrugated paper may be used which may be bought already cut to fit the size of the box or barrel. (Fig. 29.)

Very little pressure should be used in nailing on the bottom after the box is filled; indeed, the mistake is frequently made of pressing too hard and causing every apple in the package to show a bruise when opened up for sale, thus making a No. 2 grade of what was packed up as No. 1. Usually the knee will give sufficient pressure, but, if not, a convenient press can be easily made by any one who is at all ingenious. The writer uses a press framed of 2 x 4 lumber, the rest for the box about one foot high from the floor, but the back pieces high enough to receive the hinges for a sort of iron frame that can be thrown up, or be brought down to rest upon the box lid near enough to the ends to permit of nailing. This iron frame projects over the box far enough to receive a board six or eight inches wide on which the knee of the nailer is placed, the pressure on which

will be found sufficient to hold the box cover snugly in place while driving the nails. A somewhat similar contrivance has been made by A. E. Sherrington, a cut of which appears as Fig. 30.

Wire nails, about two inches long, waxed so as not to pull out easily, will be suitable for nailing on the bottoms.

When the box is closed it should be branded with the name of the variety, the grade, the shipper and the consignee. All marks should be kept to one end, so that, when piled with that end outermost, all the marks can be seen. It is usual to have the word "top" printed at the factory on the top side, and the words "Variety," "Grade," "Consignee," "Shipper," on one end, leaving spaces for filling out; also the word "Canada" in large red letters, for our Canadian apples are gaining a reputation abroad and nothing is lost by keeping the name prominent, especially on our fancy stock.

Shipping car lots.—

In filling a car these boxes will pack lengthwise, leaving an inch space for circulation of air between the sides, while the little cleat usually placed on each end of the top will give air space across them. The second tier of boxes should be placed so as to break joints with those of the first, and so on. Laths are useful, tacked across the tops to bind the layers together.

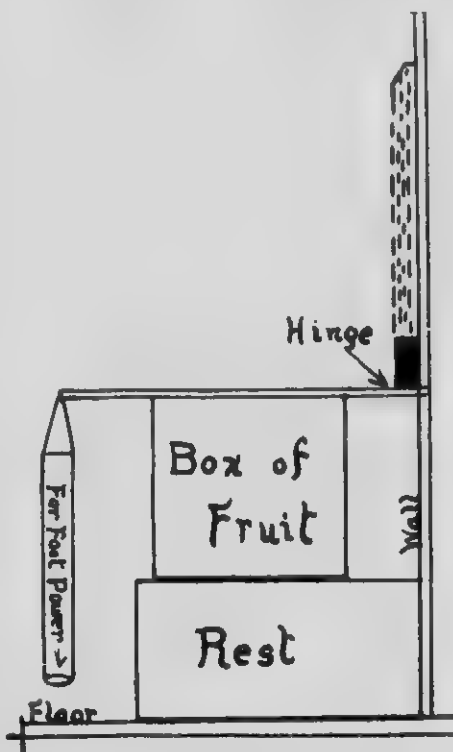


FIG. 30.—A HOME-MADE NAILING BENCH AND BOX PRESS.

Bench used in packing house of Mr. A. E. Sherrington, Walkerton, Ontario. A similar one could be constructed by any fruit grower. It is simple, cheap and efficient.

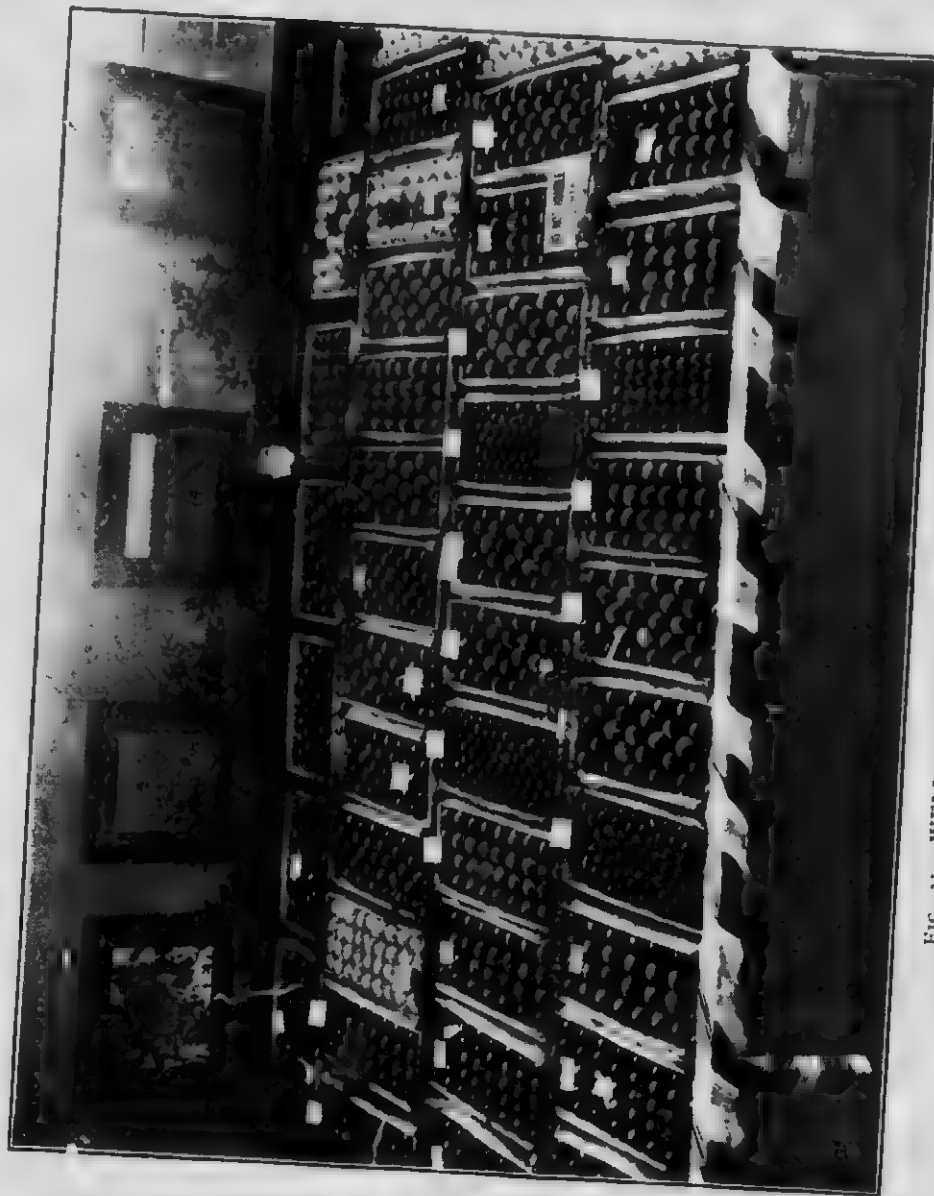


FIG. 31.—WELL PACKED BRITISH COLUMBIA FRUIT

The minimum weight for which car load rates are allowed by our railways is ten tons, or 24,000 pounds; and, as the boxes of apples weigh about 50 pounds each on the average, about 500 will be required to make a car lot, and there will be room for many more than that number. If made up of apples



FIG. 12.—PACKING THAT PAYS.

This box of apples was shown at the Niagara District Exhibition. The pack is uniform and correct. The lace paper adds to the appearance

in barrels, from 140 to 160 will be needed, according to the size of the barrels.

In sending a car load of apples to any point in Canada, a simple shipping receipt from the local agent, with the car number, should be taken and forwarded at once to the consignee with other particulars. The freight need not necessarily be paid in advance, but it must be guaranteed to the company.

If the car load is for export, one needs, in addition to the ordinary receipt, to ask the railway agent for a through bill of lading in duplicate, one copy to be speedily forwarded to the consignee in the foreign country, and the other to be filed. Without this through bill of lading the consignee will have difficulty and delay in securing delivery of the consignment.

Freight rates in car lots.—These are subject to change, but, at the time of writing (January, 1910), they are quoted as follows, per 100 lbs., for boxes or barrels of apples:

From Toronto to Montreal (local)	\$0 22
From Toronto to Montreal (for export)	18
From Toronto to St. John or Portland (winter export)	30
From Toronto to Winnipeg	55
From Toronto to Brandon	68
From Toronto to Calgary	1 08
From Vancouver to Calgary	87
From Vancouver to Winnipeg	1 50
From Vancouver to Sidney (N.S.W.)	1 40
From Vancouver to Hong Kong (China)	1 40
From Toronto (via Vancouver) to Sidney or Hong Kong	1 40
From Montreal to Liverpool (per barrel)	63
From St. John or Portland to Liverpool (per barrel)...	56

Three boxes are usually taken for a barrel.

It will be observed that for export the inland rate is slightly higher in winter and the ocean rate slightly lower on account of the necessity of using the ocean ports.

Freight rates on less than car lots.—The following rates per 100 lbs. are quoted for apples, viz:

	BARRELS.	BOXES.
From Toronto to Montreal	\$0 22	\$0 22
From Toronto to Winnipeg	84	1 15
From Toronto to Brandon	1 04	1 32
From Toronto to Calgary	1 68	2 13
From Vancouver to Calgary	1 29	1 62

For cool air storage on steamship to Liverpool, which means that the air in storage is kept at about the temperature of the sea-air by means of Sirocco fans, the extra charge is one shilling (24 cents) per barrel.

For cold storage with a temperature held at about the freezing point, or a little below, the extra charge for barrels is ten shillings (or \$2.10), per gross ton of 2,240 lbs.; and for boxes 15 shillings (or \$3.60), for 40 cubic feet, which measurement is intended to represent a gross ton.

For early apples, in particular, this cold storage is a necessity in order to land them in good condition for best prices; also it is often useful for winter apples which have been held over for spring sales.

CHAPTER XVI.

MARKETING APPLES.

No fruit grown in the temperate zone has a wider range of markets than the apple. And Canadian apples are the finest apples in the world in respect to beauty, flavor and keeping qualities. Everywhere they are in demand. Even in the United States Canadian-grown apples are at a premium especially our crisp Spys and our delicious Snows. Our chief apple market during the last half of the nineteenth century was Great Britain, and even yet it seems to be almost unlimited in its demands; but other good markets are opening to us owing to the increased and improved means of transportation both by land and sea. Shipments are now being made direct from Canada to France, to Germany, to Australia, to China and Japan. As early as 1895 the writer had boxed apples sold in Sydney, Australia, in December at \$3.75, with a through rate from Toronto, via Vancouver, of \$1.00 a box! Since then transportation conditions have much improved; and the rate is now only about 70 cents a box, or \$1.40 per 100 lbs. in car lots; but, until the steamships provide proper cold storage for carrying apples across the tropics, this trade cannot be encouraged.

The great twentieth century market for Canadian apples is our own great North-West. Already it has become a stiff competitor with Great Britain; and, when we consider the thousands upon thousands of families going into that country every year we cannot doubt that, in our greater Canada, there will be in the near future ready sale for all the apples which can be grown in the magnificent orchards of Ontario, British Columbia and Quebec. We do not say Nova Scotia, simply because, being so near an Atlantic sea port, that province may always continue exporting her apples to British and continental markets.

Selling apples.—Previous to the year 1857, when steam railways began to be extended in Canada, there was no means of disposing of one's surplus apples, unless near a lake or ocean port. There were some orchards in the old Niagara District of

Ontario, and the writer remembers well the long journey of eighteen miles to Hamilton with wagon loads of apples in old flour barrels, either to be sold in the market or to be put on board a sailing vessel for Montreal.

Later we had representatives of Montreal houses buying from us in our orchards, the fruit to be packed by us in barrels for them to export. Then came an era when these houses would engage packing gangs to go to the orchard to pack the apples purchased; and then again, with the development of the railway systems came the era of the great apple storage houses, in which large quantities were stored to be packed and shipped during the winter, just when the prices were the highest.

Co-operative selling.—During the years 1906 to 1908 the individual apple growers in many sections, finding themselves too much at the mercy of middlemen who frequently showed in their sales too little advance in prices for fancy and No. 1 grades of apples, began to form themselves into co-operative associations, with a paid manager, whose duties included the proper supervision of the packing and the making of f.o.b. sales in car lots. This plan has been proving very successful where the right man has been engaged as manager; over thirty such associations being in successful operation in Ontario and British Columbia during the latter year, with others in prospect.

Organization.—McNeill says: "To organize an association is a comparatively simple matter. It is expected, of course, that the whole subject has been discussed in the neighborhood, and that the expediency of organizing is conceded. In such cases a preliminary meeting is usually held for the purpose of selecting officials. The officers that are usually appointed are a president, vice-president, secretary and treasurer, together with five or more directors. Sometimes the office of secretary and treasurer is combined. It will be better, however, to combine the office of secretary and manager. It is desirable that all the officers should command the confidence of their fellow fruit growers. Perhaps the most difficult office to fill would be that of manager; nevertheless, it is a matter of experience that men who have made a success of their own business by generous methods, do not fail when they are placed in charge of a co-operative association. Having decided upon the officers, the next step is to secure incorporation. The exact steps for this purpose will be somewhat different in each province. The secretary

should write to the Provincial Department of Agriculture asking for information with reference to the incorporation of apple sellers' associations, and he will receive full instructions how to proceed. In British Columbia incorporation will probably be under the Agricultural and Horticultural Society's Act. In Ontario the Co-operative Cold Storage Association's Act will be available. There is no special Act for such societies in the Maritime Provinces; but the General Stock Company Corporation Act will cover the case, though the fees are larger in the case of Ontario and British Columbia."

These bodies are not formed on the same lines by any means; and the constitution will vary considerably for a large list of members compared with one for a small and limited list where all the fruit is packed and sold from a central packing house.

The following is a copy of the Constitution and By-laws of two such associations which are in successful operation in the Province of Ontario:

THE ——— FRUIT GROWERS' AND FORWARDING ASSOCIATION.

CONSTITUTION.

1. This Association of Fruit Growers shall be known as "The ——— Fruit Growers and Forwarding Association."

2. The object of the Association is the better production and sale of fruit grown by its members.

3. The Annual Meeting of the members of the Association shall be on the first Monday of December in each year. Special Meetings may be held at any time upon the call of the President by written notice.

4. At the Annual Meeting the Directors of the Association shall be elected.

5. At any meeting of the Directors a two-thirds representation of the Directors shall constitute a quorum for the transaction of business.

6. The Officers of the Association shall consist of a President, Vice-President and Secretary-Treasurer.

7. Immediately after the Annual Meeting and the election of Directors it shall be the duty of the Directors to elect officers as named in by-law six, the President and Vice-President to be chosen from the Directors.

8. The President, or in his absence the Vice-President, shall preside at all meetings of the Association. In the absence of both, a presiding officer shall be chosen from those present.

9. The Secretary-Treasurer shall keep a record of the proceedings of all meetings of the Directors and the Association. He shall keep a record of all receipts and disbursements of the Association.

10. Any Fruit Grower within a radius of eight miles of ——— shall be eligible to become a member by a two-thirds vote of the Directors of the Association.

11. The constitution or by-laws may be amended at any regular or special meeting upon a two-thirds vote of the Directors.

By-Laws.

1. The Board of Directors shall meet semi-monthly or at the call of the President, such meetings not later than July 1st of each year.
2. It shall be the duty of all Officers to attend regular or special meetings of the Association, and hold office until their successors shall be elected.
3. When a vacancy shall happen by death or resignation in any of the offices, it shall be filled at the next regular or special meeting.
4. At the annual meeting of the Association in each year the President shall render a statement of the business of the season in full. (N.B.—In some cases this is the duty of the paid manager.)
5. Each and every member of the Association shall pick his fruit in prime condition, and deliver the same at packing house or shipping point.
6. An inspector or manager of the Association shall be appointed by the Directors to supervise the work of grading and packing of the fruit of the Association, the salary of the said inspector to be determined at the time of appointment.
7. The Manager shall give personal instructions in the orchards to every shipper shipping through the Association how to grade and mark his fruit according to the Inspection and Sale Act.
8. He will see to the ordering and securing of cars, and will obtain, whenever necessary, refrigerator cars, which he sees are properly iced.
9. He shall keep in constant communication with the Salesman, and shall receive orders and communicate them to the members of the Association.
10. He shall see to the making up of car lots and notifying members when to pack and deliver fruit at packing house or shipping point.
11. He shall keep a record of name and grade of fruit of each shipper in each car and forward a copy to purchaser.
12. He shall also inspect a certain number of each shipper's barrels in each car immediately before shipment, in order to ascertain if the Fruit Marks Act has been carried out, and if he finds that any shipper has intentionally disobeyed the Fruit Marks Act he shall be refused acceptance of fruit and held responsible for space in car.
13. It is agreed that shipper shall be responsible for space ordered in car whether he fills it or not.
14. If the Inspector disagrees with shippers regarding grade apples, for the settlement of such disagreement he shall choose one Director, the shipper one Director, and both jointly any disinterested person, who shall decide, basing their decision on the Fruit Marks Act.
15. All charges for icing cars to be paid before car leaves, such charges to be collected by a levy on each barrel the car contains.
16. Each and every member shall have the right to give away such fruit of his own raising as he may elect, but he shall not make sale of fruit outside the Association except windfalls and cull grades, or any fruit that may not be accepted by the Association. Any member so doing shall pay into the Association treasury the sum of 50 cents per barrel for all fruit so sold excepting grades aforesaid.
17. Whenever in the opinion of the Directors it is impossible for the Association to receive at its packing house all fruit grown by its members, they may permit individual members to grade and pack the same for shipment through the Association, such grading and packing to be subject to the inspection of the Inspector appointed by the Association.
18. All members of the Association shall spray their orchards at least four times, and as often beyond that as they deem proper.
19. No fruit grower shall be admitted as a member of the Association except by a two-thirds vote of the Directors.

The following are the

**RULES FOR THE REGULATION, GOVERNMENT AND MANAGEMENT
OF THE ——— FRUIT GROWERS' ASSOCIATION.**

1. This Association shall be known as the ——— Fruit Growers' Association.

2. The objects of this Association shall be to encourage the fruit growers in the County of ———, who are interested in the improvement of the quality and quantity of fruit, to co-operate for the purpose of securing a better and more uniform system of packing and marketing of their fruits.

3. Any person in the County of ——— whose interests are in harmony with the fruit-growing industry and is recommended by the Executive Committee, may become a member by paying to the Secretary-Treasurer the sum of one dollar, on or before the first day of April in any year, and such payment shall entitle such person to all the rights and privileges of membership for the ensuing year.

4. Any member of the Association may withdraw at any time during the month of January, by giving notice in writing to the Secretary.

5. The Annual Meeting of the Association shall be held on the first Wednesday in March in each year, at such place as the Association may select. The business at the Annual Meeting shall be the receiving and disposing of the auditor's annual report upon the business of the preceding year, the annual election of officers, and such other business as may be brought forward by the Executive Committee.

6. All elections shall be by ballot, plurality electing, and shall be conducted by two scrutineers appointed by the chairman.

7. At the Annual Meeting five members shall be elected as an Executive Committee, who shall have the general management of the Association in buying, selling and any other business of importance. At any meeting of the Executive Committee three shall constitute a quorum for the transaction of business. Two auditors shall also be elected at the Annual Meeting who are not members of the Executive Committee.

8. Special meetings of the Association may be held at any time upon call of the President, by written notice mailed to each member at least five days before the meeting.

9. Special meetings shall also be called by the President whenever required to do so in writing, by one-fifth or more in number of the members of the Association.

10. At any meeting of the Association, 15 per cent. in number of the members shall constitute a quorum for the transaction of business.

11. The officers of the Association shall consist of a President, a Vice-President, who shall be chosen by the Executive Committee from among themselves at the first board meeting after the annual meeting. The Manager and Secretary-Treasurer may be chosen by the Executive Committee from among themselves. Special Meetings of the Executive Committee may be held at such times and places as they may select.

12. The President, or in his absence the Vice-President, shall preside at all meetings of the Association. In the absence of both, a chairman shall be chosen from the members present.

13. The Manager and Secretary-Treasurer for the Association shall have charge of the business in detail, but cannot close any dealings unless authorized to do so by the Executive Committee.

14. It shall be the duty of each member to prune and fertilize; he shall also spray three times each season with the formula, and at such times as recommended by the Manager of the Association.

15. All good barreling apples grown by members of the Association (excepting for their own use) are to be handled by the Executive Com-

mittee, and any member disposing of his or her own apples shall pay to the Association the sum of 50c. per barrel.

16. All apples are to be packed in accordance with the grade adopted by the Executive Committee.

17. Each member shall pay for the head packer who is sent to his or her place to oversee and assist in the packing, while packing their fruit.

18. The books of the Association shall be audited before the date of the Annual Meeting in each year, and the report of the receipts and disbursements, properly signed, shall be read at such Annual Meeting. The members may order a special audit of the books to be made at any time, and the Auditors shall report thereon without necessary delay.

19. When from any cause a vacancy occurs in any of the offices of the Association, it shall be filled by the Executive Committee at their next meeting. Absence without leave from three consecutive meetings of the Executive Committee shall create a vacancy.

20. The Manager and Secretary-Treasurer shall be employed to look after the interests of the members of the ——— Fruit Growers' Association in getting quotations on barrels and spraying material; and show the members how to prune, spray, cultivate, fertilize, pick and pack their orchards to the best of his ability; also to give spraying and packing demonstrations.

He is also to look after the services of good packers and have one at each orchard while packing the fruit, the expense of the packer to be paid by grower while packing at his or her place.

He also is to look up the best markets for selling the fruit. He agrees also to ship the fruit and look after collections, but cannot close any deal in buying, selling or dividing money without consent of the majority of the Executive Committee. He also does the managing Secretary-Treasurer's work.

For this work the Executive Committee is to pay him twenty cents per barrel out of the proceeds of each member's apples.

21. Every dispute between members and the Association, or any person claiming through or under a member, or under the rules of the Association, and the Executive Committee, Treasurer, or other officers thereof, shall be decided by arbitration in the manner following: The party complaining shall make a statement in writing of the matter complained of or in dispute, and shall therein name the person he appoints as arbitrator, and shall place such statement in the hands of the Secretary of the Association. Within ten days of the receipt of such statement the President shall name a second arbitrator, unless he is a party to the dispute, in which case the Executive Committee will appoint the second arbitrator. The two arbitrators will meet and appoint a third arbitrator, and the arbitrators so appointed shall meet without unnecessary delay and hear and determine the matter in dispute, and file an award with the Secretary of the Association, which award, if signed by at least two of the arbitrators, shall be binding and conclusive on all parties without appeal. Nothing herein contained shall be construed to prevent both parties agreeing upon one arbitrator, whose decision in such case would be final. All arbitrators appointed under this Section must be members of the Association.

22. The Secretary-Treasurer shall keep a record of the proceedings of all meetings of the Association or its Executive Committee, and of all receipts and disbursements, and he shall report the condition of the finances annually, or as often as the Executive Committee shall desire. He shall also attend to the correspondence of the Association and keep the same on file.

23. These rules may be amended at any regular or special meeting by a vote of the members present. Notice of any proposed amendment must be given each member by letter or otherwise at least five days previous to the meeting.

CHAPTER XVII.

STORAGE HOUSES FOR APPLES.

A large apple storage house in an apple growing section is a great encouragement to the industry. The town of Brighton, Ontario, for example, has four of these houses having a capacity of from 10,000 to 50,000 barrels. These houses give employment to great numbers of men, and afford shelter for the product of the twenty-acre orchard, of the quarter-acre garden, or of the single tree; and they are the meeting place for buyers and shippers after the rush of the apple harvest is over.

Some of these houses have three storage floors, inclusive of the cellar, and are made frostproof by thoroughly insulated walls. No ice is used for cooling, but the doors and windows are opened in cool weather just enough to keep the temperature down nearly to the freezing point.

The apples are picked from the trees into the barrels, but not sorted or packed; they are headed and brought into the storage house to be emptied and packed during the winter, thus affording winter work for the men, and plenty of leisure for proper packing and making sales.

These apple houses are paying investments for capital in apple sections. The common charge for storage is six cents a barrel for the season, with the use of a comfortable packing room, so that a house that would store 10,000 barrels would yield the owner an annual rental of five or six hundred dollars. In this way some of these houses are used by apple speculators who buy in parts at some distance away, the Grand Trunk Railway allowing the stop-over on a through bill of lading for an extra of 11 cents a barrel.

An apple house for 4,000 barrels.—Prof. Sears, of Nova Scotia, says that "apple warehouses are each year becoming more common in the great apple district of Nova Scotia, the Annapolis Valley. They are built either by large speculators who deal extensively in apples, by English commission firms for the accommodation of their patrons, or by co-operative associations of the growers themselves, and are used either for the

permanent storage of fruit or for temporary storing of apples as they are brought from the farm, and until they can be forwarded by rail to Halifax, and there loaded on steamers for England. Fig. 33 shows one of several which were built in 1899. It is 85 feet long by 20 feet wide, and has a capacity of about 4,000 bbls., with loading accommodations for three cars at one time along the side.

"The building rests on a stone and brick cellar wall eight feet deep, and the superstructure has walls ten feet high. The walls are covered, on the outside of the studding, with two courses of inch boards, with building paper between, and this again is covered with paper, with shingles on the outside. Inside, the walls are first lathed and plastered with selenite and lime mortar. Then inch strapping is nailed against the studding, and the whole is covered with 1-inch tongued and grooved



FIG. 33.—Perspective of Nova Scotia Apple House

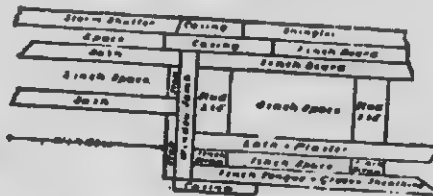


FIG. 34.—Section through Wall and Window.

spruce sheathing. The ceiling is covered with the same kind of sheathing, with building paper laid lengthwise of the joists between them and the sheathing. The upper floor is also laid double, with paper between, thus protecting the body of the building from frost from above.

"The window and door frames are made with double casings buried in the covering in such a manner as to preclude the possibility of draft or frost, as seen in Fig. 34. The windows have double sashes, and are provided with storm shutters for protection against heat as well as cold. The doors are double, one swinging outward and the other inward, and fitting closely into beveled jambs. These doors are built on 2-inch pine frames, with 1-inch tongued and grooved sheathing on each side of frame, and paper between.

"There are three hatchways in the lower floor, provided with gratings, or tight hatches if required. The ventilators extend from the ceiling to the roof, and are provided with slides

to close when necessary. The cellar has also double windows and 4-inch ventilator tubes in the sides. Both the cellar and the main floor of the building are proof against frost in the coldest weather, and altogether this warehouse is admirably adapted to the purpose for which it was built, and has proved invaluable to shippers."

An apple house for 1,000 barrels.—The *Country Gentleman* gives the following details of a small-sized apple storage house: "The main storage room of the house herewith illustrated is 36 by 38 feet, and will hold just about 1,000 apple barrels when full. They will then be piled up three tiers high, which is not an inconvenient arrangement. Apple growers have generally found it best to store apples in barrels. The house



FIG. 35.—Fruit Storage-House.—Side.

also has a sorting and packing room 10 by 36 feet, all of which space will be needed. This packing room stands next to the outside door, and the only entrance to the storage room is through this sorting room.

This protects the storage room from outside temperatures and permits work to go on, either the bringing in fruit or the taking it out, without disturbing seriously the atmosphere of the storage room. The space overhead will be needed for storing barrel stock, etc.

"The front double sliding door should be six feet wide, and the two inside doors should be three feet six inches. It will be an advantage to have the inside doors arranged as shown in the plan. If a single door is used between the two rooms, and is put in the middle of this partition it will admit more drafts of the outside air to the storage room, and will not be so convenient in handling barrels from one room to the other.

"No ice or artificial refrigeration is needed in the apple house (for fall and winter use), for the temperature can be easily controlled by the windows and the ventilators, shown in the various elevations. This method has been tried by hundreds of fruit growers, and has been found much superior to ice storage under most circumstances.

"The walls should be double-thick. Inside they should be boarded with matched lumber on the studs, and then closely ceiled on top of this. The ceiling should also be heavily painted. This is absolutely essential. Outside they should have a sheeting of inch lumber and a coat of building paper on top of this, the whole to be covered with matched novelty siding. This may seem a good deal of material to put into the walls, but it will pay. Still, one or two layers may be omitted at the owner's risk.

"This house will cost from \$800 to \$1,200, depending on who builds it, and where." (See Figs. 35, 36, 37 and 38.)

Cellar storage.—It is a very stale but oft-repeated advice, to spread out winter apples and pears on shelves in the cellar, and the decayed ones to be removed from time to time. We must wholly disagree with such a course, for when exposed, the apple rapidly loses its moisture and becomes shrivelled, which also causes deterioration of quality.

On this account apples and pears in cellar storage should be kept tightly closed, and they will open up plump and fresh.

The great secret for keeping apples and pears is a cool temperature, and 35° to 40° F. will be found most satisfactory. Usually apples are left to hang too long on the trees and become too much ripened; then they lie in piles or are stored in barrels in hot places, perhaps right out in the sunshine for weeks until the hot weather is over; then they are shut up in a warm, close, house cellar, with a temperature about 50°, and then the farmer wonders why his apples do not keep.

Let him try gathering them as soon as mature, and packing them away at once in a cool place where the temperature does not rise above 40° and see whether the results are not much more satisfactory.

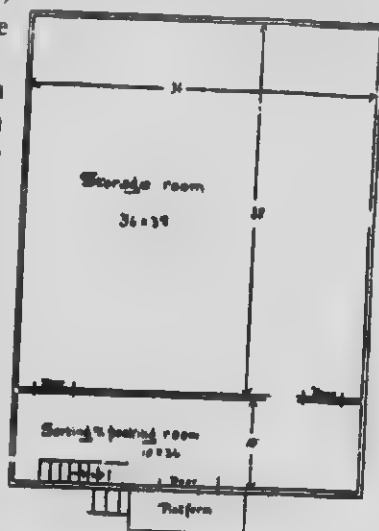


FIG. 36.—Plan

Cold storage, either with ice or by mechanical means, can now be had for fruit, both in the large cities and in transit by railway cars or ocean steamer. In the cold storage house the usual charge is about 40 cents a barrel for the season, and this

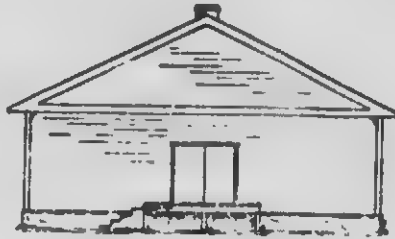


FIG. 37.—End Elevation.

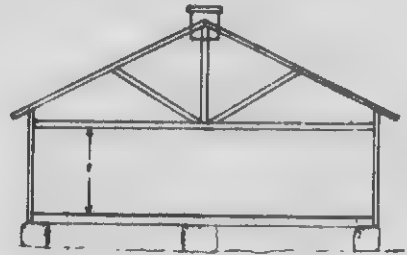


FIG. 38.—Section

is usually more than made up by the advance in price in the spring, while sometimes the advance amounts to three or four times the cost of storage.

The Joint Stock Company Plan.—A company of this kind was organized in 1905 at Thornbury, Ontario, called "The Georgian Bay Fruit Growers, Limited," share capital \$25,000, divided into 1,000 shares of \$25 each. A charter was obtained under the Ontario Act, enabling the company to deal wholesale and retail in all kinds of fruit; to build and own fruit houses, cold storage plants, and to own and operate evaporators, canning factories, cider and pulp mills, factories for the making of barrels, boxes, crates and any other packages required in the handling of fruit.

Five charter members subscribed \$500 each, or one-fifth of \$2,500, which is 10 per cent. of the amount required, giving each 20 shares. The provisional stock was soon all sold, providing funds for carrying on building operations; and some of the general stock was quickly taken up also, making the membership count up to about 125.

Such a company has a great advantage over the ordinary association, which has no winter storage and is obliged to ship in the fall when apples are cheap. Mitchell, the manager, writes: "A storage fee is charged to members of at least three cents a barrel up to 100 barrels a share; on over 100 barrels a share at least five cents; to non-members, at least ten cents. The total

fees are returned as a dividend on the investment. When there are more than enough to pay six per cent. the balance is placed in the bank as reserve against a light year. The storage capacity of the building is 10,000 barrels, and, being situated on the main switch of the G.T.R., it gives the very best facilities for shipping.

"The fruit is all graded and packed in the fruit house by experienced men, and so well is it being done, the company is



APPLE STORAGE HOUSE AT THORNBURY, ONT.

(After "Canadian Horticulturist.")

already outselling some of the old shippers. The company has a banking by-law, whereby warehouse receipts can be issued on the security of the apples, and advances can be made to our members as soon as the fruit is brought in. The members do not have to wait until the fruit is sold before realizing on it. This helps the members out while the apples are held in storage.

"Everything is working satisfactorily. There are already behind the company enough orchards to produce in a good year 25,000 to 30,000 barrels. The total capital stock is offered for

the purpose of building more apple houses, cooper shops, cold storage, an evaporator, etc. The desired object is to have the whole district in one big company, with several fruit houses under one head office, to do business on a big scale, and thus reduce expense of management. Already barrels are cut from fifty to thirty cents each.

"When a member brings in a load of apples he receives a ticket for the same. A duplicate, which the company keeps, is entered in the ledger to his credit. When the fruit is packed, he is again credited with the amount of No. 1's and No. 2's which his apples graded, also the culls, if any. The average selling price on each variety and grade is the price which all receive."

CHAPTER XVIII.

SOME INSECT ENEMIES OF THE APPLE.

So many books have been written on practical and scientific entomology, describing the insects affecting our fruits and the remedies for them, that we need only refer to them in the briefest way in this work, and that rather with a view of warning the novice about the difficulties to be encountered than of being of any practical service to the experienced apple grower.

Adopting the order used in Dr. Saunders' excellent work, entitled "Insects Injurious to Fruits," we will classify the insects according to the parts affected.

THE ROOTS.

The Apple Root Plant Louse.—This insect is also known as the Woolly Aphis of the apple, because it sometimes appears on the trunk of the tree with its body covered by a bluish white cottony substance. It attacks the roots and produces warts and excrescences of all kinds, which tend seriously to stunt the growth of the tree. Scalding hot water poured freely about the roots is recommended as one of the best remedies.

THE TRUNK.

The Round-headed Apple Tree Borer.—Dr. Saunders describes this insect as first noticed in America in 1824, and being very destructive to apple trees about Albany in 1825. It is not very common in Canada. The parent beetle deposits its eggs near the base of the trunk and the young larvæ remain three years in the sapwood, doing much damage. If several are present in the same tree they will completely girdle it. The eggs are usually deposited in the summer months, and a wash of thin soft soap to which is added a strong solution of washing soda in water, applied early in June, and perhaps again early in July, will render the tree safe from its attacks. A wash of the well-known kerosene emulsion is also effective.

The Flat-headed Apple Tree Borer (Fig. 39).—This is the borer most troublesome in Canadian orchards, especially in those that are sod bound or otherwise stunted in growth. It attacks any part of the trunk, and often even the larger branches. The presence of the larvæ is easily detected by the castings, and by the discoloration of the bark. It is destroyed by a little cutting with a knife, accompanied by probings with a wire. As a prevention the wash recommended above for the round-headed borer is effectual. The woodpecker is a natural enemy of this borer, and, therefore, should be cherished as a true friend of the apple grower.

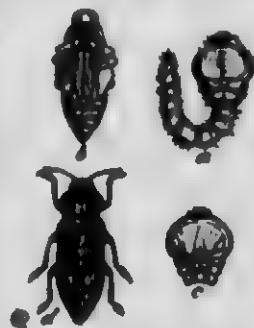


FIG. 39.—Flat-headed Apple Tree Borer.

THE BRANCHES.

The Oyster-Shell Bark Louse (Fig. 40) is very prevalent in old orchards; and in neglected cases the trees soon show impaired vigor owing to its presence. We have seen bearing orchards so badly affected with it that many trees were in a dying condition, and yet the owners seemed to be utterly ignorant of the cause of the trouble. This pest is easily recognized by the brownish winter scales shaped much like an oyster shell, but only about one-sixth of an inch in length, which are disposed irregularly along the bark of the twigs and limbs, and sometimes on the trunks, of apple trees.



FIG. 40.—Oyster-shell Bark Louse. Natural size. Often mistaken for the Scale.

Underneath each of these scales may be found a mass of eggs, varying from 20 to 100 in number, which hatch out about the beginning of June and, in warm days, the minute young lice move about searching a suitable part of the bark on which to attach themselves and suck nourishment with their sharp beaks. When once settled the louse remains fixed and, by the end of summer, becomes simply a covering for a new mass of eggs. Only one brood of these lice is produced in

Canada, but farther south there are two broods, one in May and another in September.

The remedy consists in scraping the trunks and large limbs at least of old trees in winter or early spring to remove the loose bark, and washing with a strong solution of soft soap and washing soda, or in spraying with kerosene emulsion in early June, or with the lime-sulphur wash in spring before the leaves appear.

The Scurfy Bark Louse develops its eggs so late in the summer that it is not very troublesome in Canada, though very common farther south. The remedies are the same as those for the oyster-shell bark louse.

The San José Scale.—This is the most to be dreaded of all the insect enemies of the apple grower, for, when once established in an orchard of large standard trees, it is almost impossible to spray them so thoroughly as to entirely rout the scale. Even an inch of infested wood, left untouched by the spray, would very soon reinfest the whole tree.

It is distinguishable from other scales by its round shape with the nipple in the centre, but it is so small that even the full-grown one is difficult to discern without a hand-glass, and often this insect entirely escapes the notice of the apple grower until the bark becomes so encrusted as to present an ashen grey appearance, and the tree shows signs of failure. This scale breeds with marvellous rapidity, covering even the fruit itself and rendering it unsalable, and completely ruining the infested tree. (Fig. 41.)

Fortunately for Canadian apple growers, most vigorous measures were taken against it on its very first appearance, some whole orchards near the border of the United States being completely rooted out and burned before any other effective remedy was known. But now the lime-sulphur wash has been proved to be a reliable remedy, applied in April or May so as to cover all parts affected. Even the apple orchard can be treated if kept closely pruned and low-headed. Several patent spray mix-



FIG. 41.—San José Scale
Natural size.

tures of concentrated lime and sulphur are being offered, which are less troublesome than the home-boiled; none of them, however, are superior to it and some of them not as effective.

Worsham and Chase, Georgia, show that the fall sprayings for control of the scale were in every case more effective than those made in the spring. The results obtained from a single spraying of the prepared lime-sulphur solution seemed to be very satisfactory. They are said to have been just as good as those obtained from any of the soluble oils and the trees seemed to be much the cleaner and healthier in appearance.

THE LEAVES.

The Apple Tree Tent Caterpillar and the Forest Tree Tent Caterpillar are similar in many respects and both are very prevalent in Canada, especially in the longer settled sections.

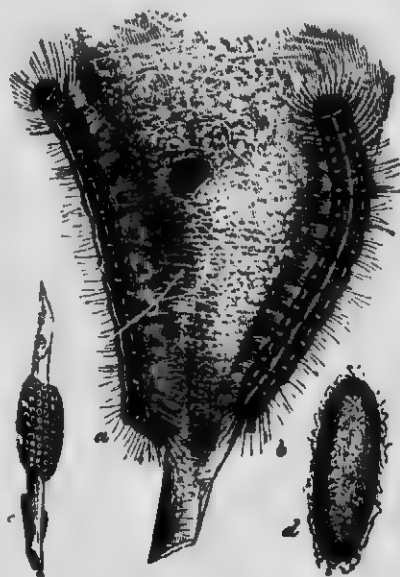


FIG. 42.—Apple Tree Tent Caterpillar.

The eggs are deposited in masses of 200 or more by the moth early in July, upon the smaller twigs in ring-like clusters. The caterpillars become fully developed in the eggs before winter, and, remaining torpid in the cold weather, are ready to hatch out about the time of the bursting of the buds in spring. Their presence in the orchard may be easily detected by the webs they form in spring across the forks of twigs for shelter in bad weather. (Fig. 42.)

The remedies are the destruction of the egg masses in winter, the gathering of the webs in spring when the larvæ are inside, and destroying them; and spraying the foliage in summer with a mixture of two pounds of arsenate of lead to forty gallons of water. The arsenate of lead, being insoluble in water, does not injure the foliage, and therefore the addition of lime is not necessary as in the case of Paris green.

The Canker Worm (Fig. 43).—Before the practice of spraying became general this insect, sometimes known as the geometer or measuring worm, was often very troublesome in the apple orchard, completely stripping the tree of leaves, and leaving it as if a fire had scorched the foliage. The parent moth (*g*) deposits its eggs in masses (*a*) of about 100 each, on exposed

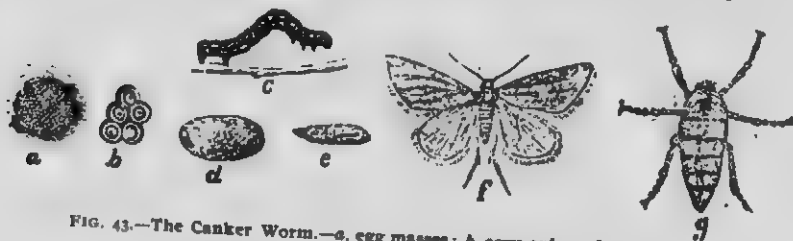


FIG. 43.—The Canker Worm.—*a*, egg masses; *b*, eggs enlarged; *c*, larvae; *d* and *e*, chrysalids; *f*, male moth; *g*, female.

situations on the twigs or branches of the tree, and these hatch out about the same time as the leaves upon which they feed.

The old remedy was to band the trunk of the tree with thick paper and besmear it about with pitch or printer's ink, in order to trap the female moth (*g*), which being wingless, was obliged to crawl up the tree to meet its mate which was winged (*f*).

Now a thorough spraying of the foliage with arsenate of lead, as described above, is the only remedy required.

The Bud Moth, the Leaf Skeletonizer, the Case Bearer, the Buccalatrix etc., being leaf eaters, are easily destroyed with the spray mixtures, and do not need any detailed notice here.

The Apple Tree Aphis is sometimes troublesome. The oval, shiny, black eggs are deposited in the autumn in the cracks and crevices of the bark of the twigs and about the base of the buds. They are usually kept in check by the larvæ of the lady beetle, which are their natural enemies and, therefore, the true friends of the fruit grower. Otherwise these aphids were difficult to destroy, until the advent of the lime-sulphur spray which seems to be effective in destroying the eggs when applied full strength in May.

The White-marked Tussock Moth has occasionally broken out in great numbers from its usual limitations and become a serious menace to the apple orchards.

The caterpillars are hatched late in May from eggs which are

found in masses of from 100 to 500. Since they are very small at first and begin feeding upon the undersides of the leaves, very careful and thorough spraying with arsenical poison is necessary to destroy them. In winter and in early spring the egg masses are easily detected and destroyed either by burning or by the use of creosote oil.

THE FRUIT.

The Codling Moth.—This is really the most serious enemy of the apple grower. Imported from Europe early in the nineteenth century, it has gradually spread over almost all parts of North America. In the Province of Ontario, especially in the more southerly parts where there are two broods each year, the damage done by this insect has become so serious that more than half the fruit gathered from neglected orchards is unsalable, even as No. 2 grade.

The first brood flies about the time the blossoms open and the female moth deposits her eggs in the calyx just as the young apples are forming and from time to time thereafter. Each moth lays about fifty eggs. The egg hatches within about a week and the larva begins eating its way toward the core. Herein is evident the use of spraying with Paris green, or arsenate of lead, as a remedy, for if the particles of arsenic can be lodged where the young worm takes its first bite its doom is sealed. The first spraying for codling moth, therefore, should be just about the time of the falling of the petals and while the young apple is still upright, and the second spraying should follow within two or three weeks. If, however, the first spraying is thoroughly done, and with sufficient force, the second is not so important.

The larva reaches full growth within about a month after the time of hatching, and escapes from the fallen fruit to spin its cocoon under the rough bark of the tree, or in cracks or crevices of fences or buildings about. Within a couple of weeks or so the full grown moth emerges, and this time deposits its eggs in the sides of growing apples, as well as in the calyx end; and this constitutes the so-called second brood, which is really more injurious than the first, because it destroys apples approaching maturity. A careful spraying with arsenate of lead in August is recommended as a means of lessening the injury by this second brood. However, if the first brood is destroyed, there will be little or no danger from a second.

Melander says the Western method of controlling codling moth by one spraying aims simply to place poison beneath the stamens by filling the calyx cup. "This can best be done by throwing a driving spray through Bordeaux nozzles, at a pressure approximating 200 lbs. Most of the spraying is done from a raised platform, and a crook is used at the end of the rod to direct the spray downward. The spray must be thrown squarely into every blossom for success. A dilute spray of 1 lb. of arsenate of lead to 40 gal. of water copiously applied is more conducive to thoroughness than is a sparing use of a concentrated wash. One such application destroys the first brood and thus actually insures practically 100 per cent. of clean fruit. Thus there is no need for later applications. In addition to assuring thoroughness, high pressure means rapid work, thus reducing the labor cost. The weak formula saves quite an item. The absence of late generations of worms eliminates disfiguring "stings," which always result when late larvæ have to be destroyed by late surface applications. The single application leaves time for other orchard work after midsummer. Irrigation is not interfered with, as the orchard does not have to be dried out to permit the passage of the spray outfit. There is no damage to apple-laden branches, low hanging because of their weight of fruit, from driving a spray wagon through the closely planted orchards. Moreover, for oily skinned and glaucous varieties it is the only method that can be successfully used. A single thorough spraying has afforded practically 100 per cent. returns over hundreds and hundreds of acres of Washington orchards."

The Apple Maggot (Fig. 44).—This insect is gair upon us, and is a very troublesome pest, being more difficult to fight against than even the codling moth. Since it is as yet somewhat of a stranger we give Dr. Saunders' description of the larva: "It is a footless maggot tapering to a point in front and cut off square behind, which lives in the pulp of the apple and tunnels it with winding channels, making here and there little roundish discolorations about the size of a pea. The maggot is of a greenish white color, about one-fifth of an inch long, with a pointed head and a pale brown flattish rough tubercle behind it; the hinder segment has two pale brown tubercles below."

The perfect insect is a two-winged fly about one-fifth of an inch long, and nearly half an inch across from wing tip to wing tip. It is single brooded, and appears in July, depositing its

eggs within the flesh of the apple by means of a sharp ovipositor, often seeming to prefer apples which have been previously perforated by the codling worm.

The mature insect is not easily poisoned and, since it deposits its eggs in the apple pulp beneath the skin, the young maggots are secure until maturity when they go into the ground to transform into the pupal state.

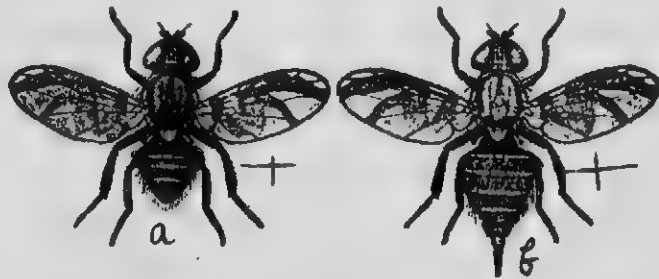


FIG. 44.—Flies of the Apple Maggot.—a, male; b, female—enlarged.

Kinney, of Rhode Island, has conducted some experiments with poultry as destroyers of these maggots, as they come to the ground. A movable wire fence was provided of suitable size to enclose a large apple tree. When this was in place about a tree, where the fruit had been destroyed by the maggot, one side of the fence was raised and the hens that were about the place were called into the enclosure and fed. The side of the fence was then let down and as soon as the grain was picked up the poultry immediately began to see what else could be found among the grass roots. How many of the maggots were discovered and picked up by the hens during the three or four days that they scratched beneath each infested tree we cannot yet tell, but the hens worked faithfully, and it appeared as if but few of the maggots were likely to be overlooked by them.

It is probable that the apple maggots remain in the pupal state in the soil beneath the trees in this latitude from the time they leave the apple in the fall until the following spring. Even in the warm laboratory the maggots that pupated in August remained in the pupal stage until February, when the flies began to appear. Thus the poultry method of attacking them seems to be applicable over a considerable length of time, and we would suggest a trial of it by those who have poultry and are troubled with this insect.

CHAPTER XIX.

SOME FUNGI AND WINTER INJURIES AFFECTING APPLE TREES.

Apple Scab.—This is the most serious fungous disease affecting the apple. Some varieties are especially subject to it, as, for example, the Snow, the McIntosh, the Fall Pippin, the Greening and, some seasons, the Spy. The Baldwin seems to be about as free from damage by scab as any variety.

This scab is really a microscopic plant, known to botanists as *Fusicladium denigratum*, which might be translated "fruit tree pest." In seasons favorable to its spread, the spores from the winter form are carried about in the air and fix themselves upon the skin of both leaves and fruit, especially when dampened by fog or dew. The young growth appears to the eye as "olive green, brown or blackish sooty or scab-like spots on the leaves and fruit, arresting the growth and causing the parts to become distorted, and often causing the very young fruit to fall."

Fortunately recent experiments have proved the great value of Bordeaux (lime and copper sulphate), and of the lime-sulphur solution applied just before the blossoms open, when it can be safely applied in what is called winter strength.

Later sprayings for scab at various intervals have frequently been recommended, but Hall, of Geneva, N.Y., seems to have proved that this spray is a preventive only and not a cure, for he found spots covered with Bordeaux enlarging as rapidly as those on fruit not sprayed. His explanation is that the scab fungus, once established, continues to grow beneath the thin outer covering or epidermis where the growing part is protected from the action of the Bordeaux.

Ripe Rot and Bitter Rot.—A rot which attacks ripe apples, often not showing itself until after storage. As a preventive, spray early in August with ammoniacal carbonate of copper, for which the following is a convenient method of preparation: "In an ordinary vessel capable of holding a gallon or

more, put 2 ounces of carbonate of copper and 1 quart of *strong ammonia*; when the copper is completely dissolved pour the mixture into a barrel and add 25 gallons of water. The solution is then ready for use."

Pink Rot.—This attacks stored apples, those which have been affected with scab and those which have been stored warm. There is no direct remedy, but prevention is

(1) Not to store scabby apples;

(2) Not to store apples when warm; they should be cooled before being packed.

Since this rot is an attendant upon apple scab, and only attacks apples of which the skin has already been broken or diseased, the best remedy is not to grow scabby apples. The best preventive treatment, therefore, is thorough spraying with lime-sulphur in the spring for apple scab fungus, and to cover the young fruit with a protective covering of Bordeaux, or lime-sulphur (summer strength) to prevent the germination of the spores of apple scab.

Canker.—This disease, as it is found in Ontario, is known as the **New York Apple Tree Canker**, and is caused by the black rot fungus. It is perennial, spreading from year to year, and is usually found in the limbs of old trees. The infection finds entrance through wounds, cracks or the punctures of insects. The first effect is discoloration of the bark, which turns black; these areas soon enlarge and sometimes encircle the branch, killing the inner bark also, and clearly defining the diseased portion. Later the bark loosens and peels off, leaving the bare wood. Paddock recommends the following treatment:

"(1) To collect and destroy diseased fruit which usually accumulates in orchards on the trees. These often contain the spores of the black rot fungus, by means of which the cankers are inoculated in the spring. The destruction of such diseased fruits will greatly diminish the liability of infection of the limbs.

"(2) To scrape the cankered areas on the limbs and to paint these areas with a disinfectant, such as copper sulphate, and to coat it with tar or paint.

"(3) To cut off the smaller cankered branches wherever possible, and to burn them.

"(4) To spray with Bordeaux. Applications made year after year appear to have a cumulative effect in keeping down all kinds of fungous diseases."

There is another, defined by Whetzel as **Blight Canker**, which is caused by bacteria and occurs most frequently on the body and limbs of young trees of bearing age. In this the discoloration is brown, the tissue watery and, for the most part, the disease is active for one season only. Whetzel has shown that the organism of this "Blight Canker" is identical with that of the well-known "fire blight" of the pear and "twig blight" of the apple. The treatment above mentioned is applicable to this canker also, with the recommendation of the lime-sulphur spray as a preventive.

The varieties noted so far as being resistant are in order of strength, Wolf River, Tolman, Pewaukee, Astracan, Tetofsky, Grimes, Winesap and Fameuse; and those most susceptible, Baldwin, Ben Davis, Mann, Hubbardston, Fall Pippin, Stark and Greening.

In brief we may mention several winter injuries, viz.:

Root killing, by cold of winter with too little moisture in the ground and too little cover. Prevent by use of cover crops or a mulch to retain moisture. Graft on crab apple stock.

Bark splitting, from freezing of succulent growth. Prevent by having wood well ripened before winter, ceasing cultivation early. As a remedy cover injured parts with grafting wax.

Sun scald, caused by frequent freezing and thawing of the part, being that most exposed to the sun's rays. Prevent by using low headed trees, by leaning tops a little toward the south-west, thus lessening the power of the sun upon the trunk; use veneer or sacking about the trunk as a winter protection.

Crotch injury, arising from ice in crotch which softens the bark, thus rendering it tender and more subject to the effect of severe cold. Prevent by having as few crotches as possible in the orchard.

Black heart, caused by the death of the young wood in winter from severe cold; the outer bark and the cambium layer remaining uninjured and continuing to grow.

Killing back, due to immaturity of wood or the drying effect of winds, leaving the wood more subject to severe cold. Prevent by having wood well ripened, or by planting wind breaks.

Excessive evaporation of moisture from wounds made in pruning. This should be guarded against by painting or varnishing over the large cuts soon after they are made.

Injuries by mice.—Thousands of apple trees are annually destroyed in Canada by field mice, owing to the cover afforded them by deep snows in winter. Where there has been clean cultivation in summer the danger is not great, but where rubbish has been allowed to accumulate in the orchard, or where sod has been ploughed toward the trees, making runways for the rodents, or where there are such fences near the trees as will gather deep drifts of snow, great damage by mice is almost certain to result,

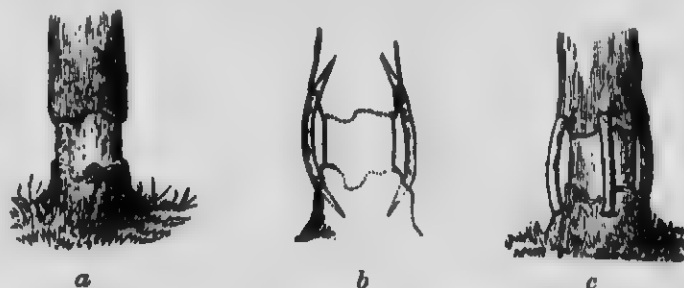


FIG. 45.—Tree Bridged with Scions.

much to the chagrin of the owner when spring reveals the extent of the mischief.

A simple method of prevention is to go through the orchard with a sharp spade late in the fall, clear away any rubbish near a tree and place a few spadefuls of fine earth as a mound against the trunk in order to turn the mice aside. Or, if fine earth is not convenient, a band of tar paper about the base, tied with a string or fastened with a small tack, will answer the purpose.

Trees that are found badly girdled in spring are often saved by using connective scions between the bark above and that below, as shown in Fig. 45, *a*, *b* and *c*.

CHAPTER XX.

TOP GRAFTING APPLE TREES.

Sometimes it is found that some varieties of apples in an orchard prove to be less profitable than others and to make the most of it such trees should be top grafted. Some growers even advise top working even the best varieties in order to propagate the special merits of individual trees. One tree of Greenings, for example, may yield apples with a fine blush and of perfect form, or a tree of Spys may yield apples of an exceptionally high color, and using scions from such trees to top graft others would intensify the good characteristics.

The apple tree may be top worked much later than the stone fruit trees; for, while the latter should be done very early in spring, the former may be deferred until the last of May or the beginning of June.

The necessities for the work are: (1) A sharp, fine-toothed pruning saw, with which to make a clean cut of the limbs to be grafted; (2) a grafting chisel, or, if this is not at hand, a common chisel or even a large pruning knife with which to split and hold open the limb for the insertion of the scion; (3) a small mallet; (4) a ball of grafting wax, and (5) a small bundle of scions.

For preparing the wax the following is one of several recipes: Resin, 4 parts by weight; beeswax, 2 parts; tallow, rendered, 1 part. Melt together and pour into a pail of cold water; then grease the hands and pull until it is nearly white.

In renewing an old tree the grafter should not attempt to complete the work in less than two seasons, a few of the smaller limbs being grafted each year, thus gradually transforming the whole top. As a rule, limbs about two inches in diameter are best for cleft grafting because the wounds will the sooner heal over.

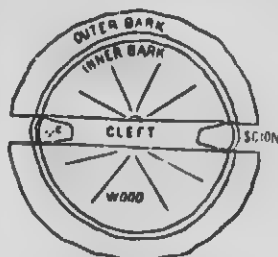


FIG. 46.—Transverse Section of Grafted Limb.

Top grafting an apple tree may be done by any farmer or fruit grower who is at all handy with tools. Skill is required in two things: First, in making the small wedge-shaped cut of the scion (Fig. 47. A). This must be done with a sharp knife, by a single drawing cut for each side so as to make a perfect wedge, usually leaving the one side a little thicker than the other, to insure close contact. Then while the split wood is held apart with the chisel, the two scions are put in place (Fig. 47. B). In the second place, skill is required in so placing the scion in the cut that the inner bark of both stock and scion may be in contact with each other and make a perfect union. The reason of this will be evident to the reader by a study of Fig. 46, which is self-explanatory. When the scions are put in place, cover every portion of the cut surface of scion and limb with grafting wax, so as to thoroughly exclude rain and the drying effects of the atmosphere, as is shown in Fig. 47. C.

Two scions are not really necessary in each cut, but it is very little more trouble to insert two than one, and, therefore, two chances of success are afforded; while, if both live, it is a simple matter to cut off one, leaving its stub to help grow over and fill up the cleft.

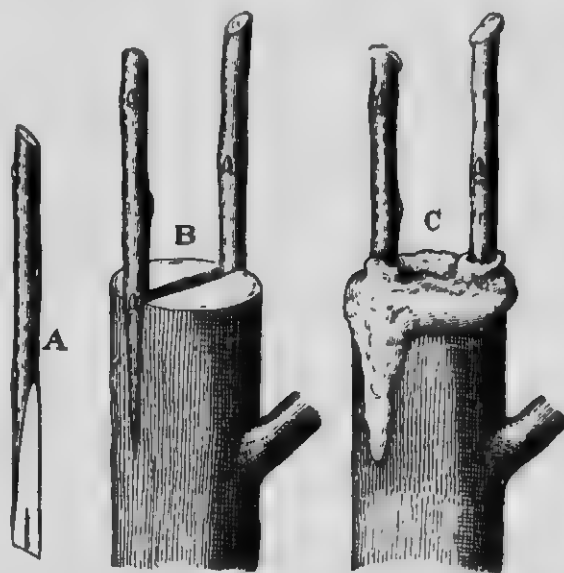


FIG. 47.—Cleft Grafting.—A, scion; B, scions inserted in cleft; C, stub and scions waxed.

PART II.

**APPLES OF CANADA CAREFULLY DESCRIBED
AND ILLUSTRATED FROM SPECIMENS
OF THE VARIETIES GROWN
IN THE DOMINION.**

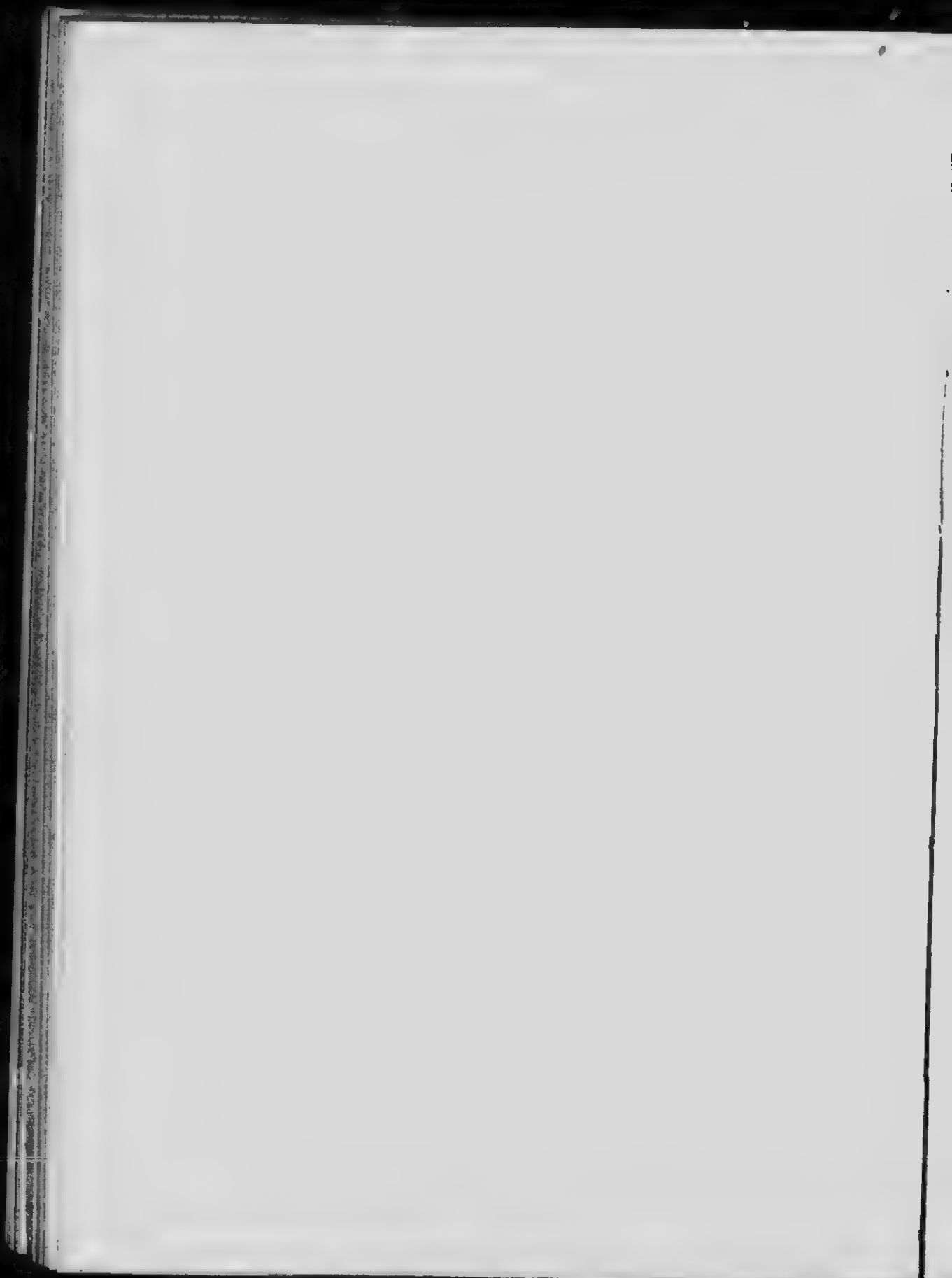
PREFACE TO PART II.

These descriptions and illustrations of apples grown in Canada have been, for the most part, prepared by the author directly from the fruits themselves, from samples grown in Canada, and the notes of the characteristics of the trees have been largely made from records taken by the writer during the ten years in which he was engaged as a fruit experimenter by the Department of Agriculture for Ontario. Many of these descriptions and illustrations first appeared in his report on "Fruits of Ontario," made to the Department by the author, in the year 1906, for the use of which, in this work, the writer acknowledges the courtesy of the Honorable the Minister of Agriculture.

The descriptions have been verified by comparison with those given in the works of the world's greatest pomologists, such as the "Dictionnaire de Pomologie," by Andre Le Roy, of France; "The Fruit Manual," by Thos. Hogg, of England; "The Fruits and Fruit Trees of America," by Chas. Downing; "The American Fruit Culturist," by J. J. Thomas; "The Apples of New York," by S. A. Beach; "The American Horticultural Manual," by Messrs. Budd and Hansen; "Apple Culture," by W. T. Macoun, horticulturist of the Central Experimental Farm; and others.

In addition to the original descriptions, quite a number by other pomologists, of new or little known varieties but little grown in Canada, with credit, are included in this work in order to make it as complete a reference book as possible for apple growers in all parts of the Dominion and also in the northern parts of the United States.

The season of maturity and use, given in this work, is applicable to the apple districts in the southern parts of the Province of Ontario, unless otherwise noted.



PART II.

APPLES OF CANADA CAREFULLY DESCRIBED AND ILLUSTRATED FROM SPECIMENS OF THE VARIETIES GROWN IN THE DOMINION.

ALEXANDER.

(*Emperor Alexander.*)

ORIGIN: introduced into England from Russia in 1817.

TREE: hardy, spreading, vigorous, productive; bears early.

FRUIT: very large size; form round, ovate, conical; skin greenish yellow, russet dots, streaked or splashed with red; stem three-quarters of an inch long, set in a deep cavity; calyx large nearly closed, set in a deep even basin.

FLESH: yellowish white; texture crisp, not very fine, moderately juicy; flavor subacid, pleasant.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: home market, first class; can be successfully shipped to Great Britain in cold storage.

SEASON: September to November.

AMERICAN PIPPIN.

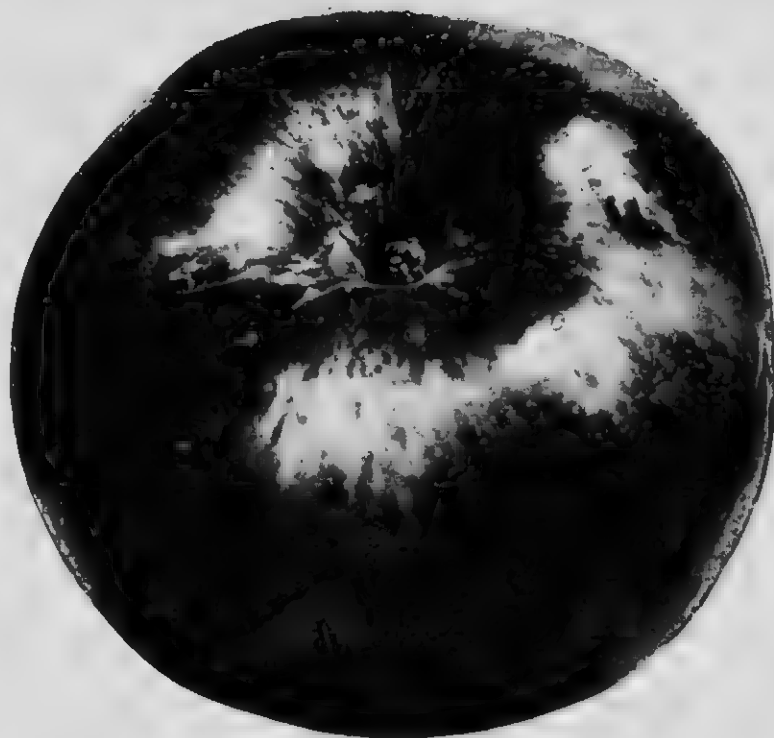
An exceptionally good keeping apple.

TREE: vigorous, spreading, productive.

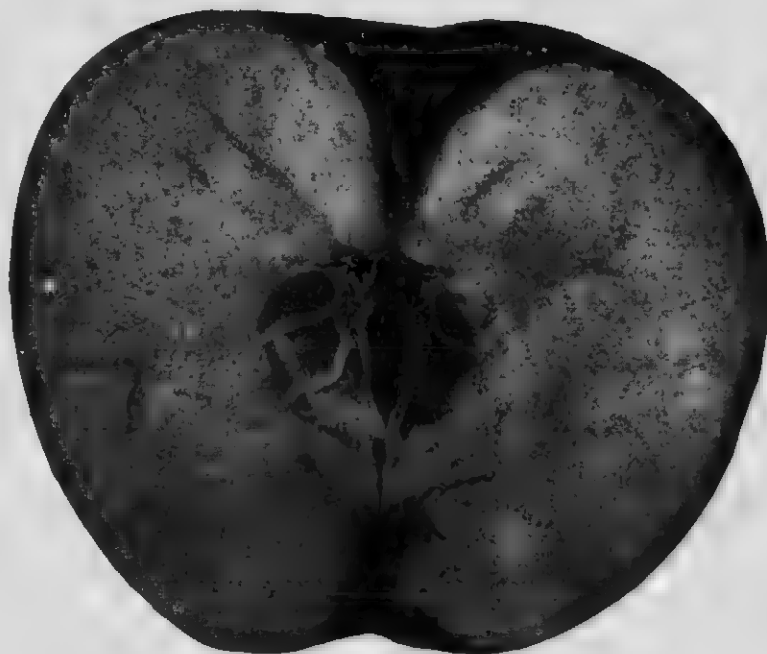
FRUIT: medium to large, roundish; greenish yellow with a pink or orange blush or lightly splashed with same; dots fairly numerous, distinct but not prominent; cavity deep, medium in width, sometimes slightly russeted; stem short and stout; basin rather deep, medium in width and slightly wrinkled; calyx large, open.

FLESH: yellow, firm, crisp, juicy, subacid; core small; quality good.

SEASON: late winter. (*Macoun.*)



ALEXANDER.



SECTION OF ALEXANDER.

AMERICAN RAMBOUR.

Commended by Thos. Sharpe, Agassiz, B.C., for that province, and described by him as follows in his Report for 1909:

TREE: a healthy, strong grower, and a regular cropper.

FRUIT: above medium size, very handsome, with red stripes over an almost clear yellow skin.

FLESH: yellowish, firm, juicy, mildly acid, very pleasant.

SEASON (British Columbia): September.

ANIS.

FRUIT: oblate to roundish conical, angular; below medium size; cavity deep, medium width, slightly russeted; stem short, slender to moderately stout; basin narrow, medium depth, wrinkled; calyx closed; pale, greenish yellow, well splashed and washed with purplish red with a pink tinge especially on sunny side; dots obscure; bloom moderate; skin thick, tough.

FLESH: greenish white; texture crisp, fine grained, juicy, tender; core medium to small; subacid, pleasant flavor; quality good.

SEASON: late September to November.

Specimens from Central Experimental Farm, described by W. T. Macoun, Oct. 15th, 1901.

ANISETTE.

Mr. A. P. Stevenson, of Dunstan, Manitoba, says this apple has been fruiting heavily there for the last nine years, and the trees are in a fine healthy condition. He describes it as follows:

Much like Duchess in size and color, but finer in texture, less acid and a few days earlier.

ORIGIN: Russia.

TREE: hardier than Duchess, bears young and quite as heavily.

FRUIT: medium, roundish, regular; surface greenish yellow, mostly covered with stripes and splashes of dark crimson, mixed and marbled on sunny side; stem medium; basin rather abrupt; calyx closed.

FLESH: white, juicy, sprightly acid, good.

SEASON: In Manitoba, the first week in September.

ANISIM.

The beautiful color of the fruit attracts favorable attention; has fruited in Manitoba with A. P. Stevenson.

ORIGIN: Russia.

TREE: a strong grower in nursery and orchard; hardy.

FRUIT: below medium, roundish conical, slightly angular; surface greenish yellow covered almost wholly with beautiful dark crimson, with heavy blue bloom; dots white, minute; cavity regular, acute, usually slightly russeted; stem medium; basin narrow, very shallow, corrugated, sometimes flat; calyx closed.

FLESH: greenish white, with green veins; quality good.

SEASON: early winter. (Hansen.)

ANTONOVKA.*

The leading commercial apple of Southern Russia.

ORIGIN: Russia.

TREE: hardy, subject to blight in some localities.

FRUIT: large, roundish, irregular, obscurely angular; color yellow; dots minute, raised, white, suffused; cavity deep, regular, with radiating, often large, patch of russet; stem medium; basin abrupt, corrugated or wavy; calyx closed.

FLESH: yellow, juicy, sprightly, spicy, subacid, good. (Hansen.)

ARCTIC.

Valuable for climates too severe for Baldwin. (Beach.)

ORIGIN: Cape Vincent, New York.

TREE: a strong upright grower and early bearer.

FRUIT: large, regular, roundish oblate, often distinctly angular, or five sided in large specimens; surface dark solid red, obscurely marbled and mixed, a little yellow ground-color on shady side, with delicate bloom; dots distinct, few, gray; cavity regular, wide obtuse with some radiating green or russet; stem short, stout; basin rather shallow, abrupt, somewhat irregular; calyx closed; segments flat, convergent. Core small, closed; cells ovate, slit; tube funnel-shaped; stamens basal; seeds plump.

FLESH: yellow, firm, moderately juicy, crisp, mildly subacid, good.

SEASON: midwinter. (Hansen.)

* Stevenson, of Morden, Manitoba, reports this variety to be exceptionally hardy.

ARKANSAS BLACK.

Originated in Arkansas; succeeds on Western Coast, but not productive enough for profit.

FRUIT: medium, slightly conical, regular, smooth, glossy; yellow, generally covered with deep crimson, small light colored dots; basin shallow; eye small, closed; cavity shallow, russeted; stem medium.

FLESH: very yellow, fine grained, firm, juicy, subacid, rich, very good. (Thomas.)

ARNOLD.

ORIGIN: seed of Spy crossed with Wagener and Spitzenberg, by Charles Arnold, Paris, Ontario; not much grown.

TREE: upright, symmetrical, productive.

FRUIT: medium, oblate, slightly angular, ribbed; color bright yellow, often with blush of brownish to bright red, usually with patches and network of russet; dots few, brown; cavity large, deep, usually russeted; stem medium, slender; basin deep, rough, slightly plaited; calyx small, closed.

FLESH: yellowish, fine, firm, juicy, rich, mildly subacid, slightly aromatic.

SEASON: January to May. (Hansen.)

ASTRACAN.

(*Red Astracan.*)

ORIGIN: imported from Sweden to England in 1816, and widely planted in Southern Ontario for a summer market apple. Scarce another apple of its season equals it in beauty of appearance; for, in addition to its rich crimson color, it is often covered with pale white bloom. Selected fancy grades of this apple are usually in good demand in Canadian markets. In cold storage it may be shipped long distances by rail, or exported to Great Britain, but otherwise it ripens rapidly after picking.

TREE: upright; very vigorous; begins bearing early; very productive.

FRUIT: medium to large, round, narrowing towards the apex; skin deep crimson when exposed to the sun, yellowish



ASTRACAN.



SECTION OF ASTRACAN.

green in shade, often covered with a thin, whitish bloom; stem stout, three-quarters of an inch long, in a deep cavity; calyx closed, set in a shallow, somewhat irregular basin.

FLESH: white, crisp, juicy, tender, becoming mealy when over ripe; acid, almost too tart to be counted first class for cooking or second class for dessert.

COMMERCIAL VALUE: first class where an early summer apple is in demand.

SEASON: early to mid-August.

BAILEY SWEET.

Valuable for all purposes, though a little tender for long shipments.

ORIGIN: New York State.

TREE: hardy, vigorous, upright, spreading, productive.

FRUIT: large, form roundish, conical, often approaching oblong, obscurely ribbed; color yellowish, mostly shaded and obscurely striped with red, and thickly sprinkled with minute dots; stalk short and rather small, inserted in a narrow cavity; calyx small, closed, set in a narrow, irregular basin.

FLESH: white, tender, not very juicy, almost melting, with a honeyed sweet flavor; core rather large; very good.

SEASON: November to March. (Macoun.)

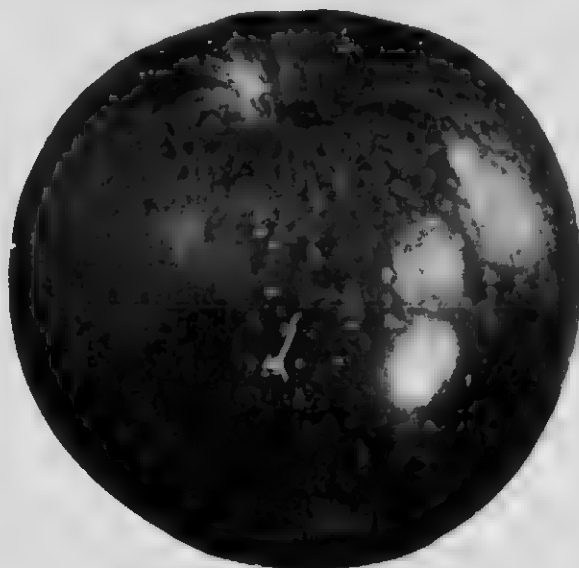
BALDWIN.

The most popular winter apple for either home or foreign markets. Usually one of the most productive, but in certain orchards of Ontario owing to prevalence of scab on foliage and lack of other varieties near, for cross fertilization, it has been somewhat disappointing.

ORIGIN: Lowell, Massachusetts, 1740; introduced by Col. Baldwin, 1787; a monument marks the place of the original tree.

TREE: not hardy outside of best apple sections; upright, spreading, vigorous grower, usually very productive.

FRUIT: large, roundish, ovate; skin yellow, shaded and splashed with crimson and red spotted with some russet dots; stem heavy, three-quarters of an inch long, in a broad cavity; calyx closed, in a deep plaited basin.



BALDWIN.



SECTION OF BALDWIN.

FLESH: color yellowish white; texture tender, juicy; flavor subacid, sprightly, aromatic.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: first class.

SEASON: November to March.

BALL.

A very good market crab.

ORIGIN: Sutton, Quebec, Canada.

TREE: thrifty with spreading head; an annual bearer.

FRUIT: slightly above medium (for crab), ovate; skin greenish white, with yellow blush on sunny side.

FLESH: crisp, spicy, rich, acid, good to very good.

SEASON: November to January. (Hansen.)

BASIL THE GREAT.

A very showy Russian apple, and considered profitable, described in Thomas' American Fruit Culturist as follows:

TREE: endures drouth, without lessening size of the fruit.

FRUIT: large, roundish, oblong, unequally truncated, irregular; yellow, mostly covered with dark red and crimson; cavity deep, acute, stem very short; basin wide, deep, abrupt.

FLESH: coarse grained, red next the skin, juicy, subacid, excellent for culinary use.

BAXTER.

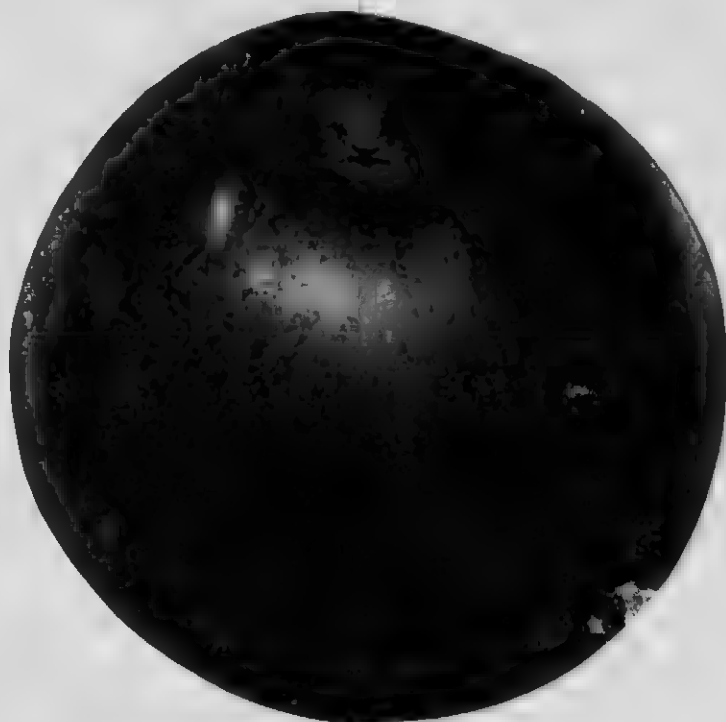
(Larue.)

A fine large red apple, which brings a high price in the British market if grown free from fungous spots, to which unfortunately it is somewhat subject.

ORIGIN: with Mr. Larue, near Brockville, Ont.; introduced by a Mr. Baxter.

TREE: healthy, vigorous, hardy, moderately productive.

FRUIT: size large to very large; form roundish, slightly conical; color red with obscure stripings of dark red, and



BAXTER.



SECTION OF BAXTER.

numerous prominent gray dots; stem half an inch long, in a narrow funnel form cavity, calyx nearly closed, in a large irregular basin.

FLESH: color white often streaked with red; texture moderately firm, not very juicy; flavor slightly acid.

QUALITY: dessert medium; cooking good.

COMMERCIAL VALUE: first class.

SEASON: October to January.

BEAUTIFUL ARCADE.

ORIGIN: Russia.

FRUIT: medium, oblong, truncated, angular; color white, yellow splashed with crimson on side; a marked characteristic is the roughened surface; cavity slightly abrupt, slightly wavy, stem very short; basin wide, corrugated.

FLESH: yellow; texture firm, fine grained; flavor sweet and rich.

QUALITY: best.

SEASON: summer. (Thomas.) August and September. (Hansen.)

BEAUTY OF BATH.

Thos. Sharpe, of Agassiz, B.C., includes this among the apples adapted to the orchards of British Columbia.

TREE: a strong grower and a regular producer of fair crops.

FRUIT: medium size, greenish russet with a blush.

FLESH: white, crisp, mildly acid.

SEASON (British Columbia): last of July.

BELLE DE BOSKOOP.

ORIGIN: Russia.

FRUIT: above medium, roundish; skin shaded and obscurely striped red on yellow skin.

FLESH: crisp, juicy, brisk subacid, rich, very good.

SEASON: late winter. (Thomas.)

BEN DAVIS.

One of the most popular market apples in the southwestern and western States, because of its great productiveness, hardness, good color, and its keeping and shipping qualities. Highly valued by some growers in Canada, but condemned by others as being of second quality.

ORIGIN: brought from North Carolina to Kentucky with other seedlings by Mr. Ben Davis, and scions taken to Southern Illinois about 1820.

TREE: spreading, fairly vigorous and very productive; needs good cultivation and judicious pruning in order to yield No. 1 fruit.

FRUIT: medium to large roundish, truncated conical, unequal; color yellowish striped and splashed with red, having scattered small whitish dots; stem slender, one to one and a half inches long in a deep cavity; calyx erect, partly closed in a deep wide basin.

FLESH: dull, white; texture firm, moderately coarse, not very crisp, juicy; flavor mildly subacid, somewhat aromatic.

QUALITY: dessert poor; cooking good.

COMMERCIAL VALUE: first class, when well grown.

SEASON: January to May.

BENONI.

A summer apple, not much grown in Canada, a failure in some localities.

ORIGIN: Massachusetts.

TREE: erect, fairly vigorous; moderately productive.

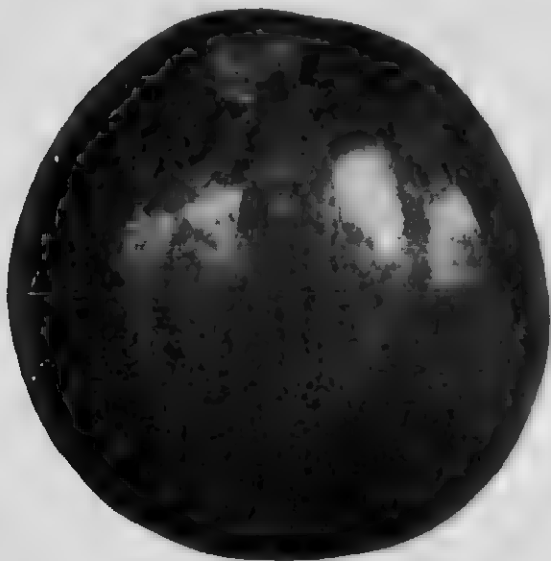
FRUIT: size below medium; form oblate conical; skin rich yellow, blushed with red in the sun; dots few and scattered; stem half-inch long in a deep cavity; calyx erect, partly closed, in a small, deep basin.

FLESH: color yellow; texture tender and juicy; flavor rich, subacid.

QUALITY: dessert very good; cooking good.

COMMERCIAL VALUE: second class.

SEASON: August to September.



BEN DAVIS.



SECTION OF BEN DAVIS.

BETHEL.

ORIGIN: Vermont.

TREE: a strong grower.

FRUIT: large roundish, slightly angular; skin greenish yellow, splashed and streaked with carmine; dots numerous, greenish yellow, prominent; cavity deep, of medium width, slightly russeted; stem short, slender; basin shallow, narrow, smooth; calyx partly open.

FLESH: whitish with traces of pink, juicy, mildly subacid; core of medium size; quality good.

SEASON: mid to late winter. (Macoun.)

BIETIGHEIMER.

A fall apple of magnificent appearance, attaining a remarkable size and beautiful color, chiefly valued for exhibition purposes. The fruit drops badly before full maturity.

ORIGIN: Germany.

TREE: habit vigorous, spreading; productive, a biennial bearer.

FRUIT: size very large, sometimes immense; form round, oblate; skin whitish yellow almost covered with pale red and having a few obscure stripes and splashes and numerous whitish dots; stem very short in a wide regular shallow cavity; calyx closed in a narrow, slightly corrugated basin.

FLESH: white; texture firm, juicy; flavor brisk, subacid.

QUALITY: poor for dessert; fair for cooking.

COMMERCIAL VALUE: third class.

SEASON: September and October.

BISHOP.

(*Bishop's Bourne.*)

Received from C. C. Hamilton, Cornwallis, N.S.

FRUIT: medium, roundish, conical, pale yellow, shaded and obscurely splashed and striped on the sunny side, few gray and light dots. Stalk medium, slender. Cavity slightly russeted. Calyx partially closed. Segments long, erect.

FLESH: white, crisp, tender, juicy, mildly subacid, slightly aromatic. Very good. Core small.

SEASON: November. December. (Downing.)

BISHOP'S PIPPIN.

The apple grown in Nova Scotia under this name is identical, according to Ragan, with the Yellow Bellflower of Ontario.

BISMARCK.

ORIGIN: New Zealand. In Dakota and Iowa it has proved tender and subject to blight.

FRUIT: large, roundish oblate, slightly tapering, somewhat ribbed toward calyx; surface greenish yellow, polished, partially covered with dull red obscure splashes, some russet-net veining; dots obscure, few, whitish, minute, cavity acute, regular, with radiate russet; stem medium; basin abrupt, nearly smooth, with fine wrinkles, calyx open; segments erect, convergent. Core half open; cells round, slit; tube conical; stamens basal; seeds short, plump, few.

FLESH: whitish, with green veinings, rather coarse grained, lively, brisk subacid.

QUALITY: good.

SEASON: early winter. (Hansen.)

BLACK BEN DAVIS.

A promising variety; better than Ben Davis.

ORIGIN: Arkansas, on farm of Rev. M. Black.

FRUIT: large, form much like Ben Davis, the skin also becoming unctuous like that variety; color of skin very handsome, a dark solid crimson, almost black crimson on sunny side, on shaded side the yellow ground color shows through, no true stripes nor splashes, but shading varies in depth of coloring; dots distinct, few, minute, yellow; cavity obtuse, medium deep, with stellate russet; stem short; basin deep, abrupt, sharp rimmed, somewhat ribbed; calyx open.

FLESH: yellowish white, moderately juicy, mild, pleasant subacid, good.

SEASON: winter. (Hansen.)

BLACK TWIG.

ORIGIN: Tennessee; grown in Washington State. Thomas describes it thus:

FRUIT: medium, oblate, yellow shaded with red.

FLESH: tender, mildly subacid, very good.

SEASON: early winter.

BLLENHEIM.

(*Blenheim Orange, Woodstock Pippin.*)

An apple that is gaining in favor in Ontario both with grower and consumer, because of its general excellence for all purposes; does not succeed in all parts.

ORIGIN: Woodstock, England, near Blenheim Park; shown before London Horticultural Society in 1819.

TREE: vigorous; a scanty bearer while young, but grows more productive with age; as a dwarf on Paradise stock it becomes an early bearer.

FRUIT: large to very large on favorable soil; form roundish oblate, slightly smaller at the apex than at the base, very regular; color yellowish, splashed with dull red on the sunny side; dots small and distinct; stem three-quarters of an inch long, stout, in a large russeted cavity; calyx large and very open, with short segments in a large green basin.

FLESH: color creamy white; texture fine, crisp, moderately juicy; flavor sweet, spicy, slightly acid.

QUALITY: dessert good; cooking very good.

COMMERCIAL VALUE: first class.

SEASON: November to February.

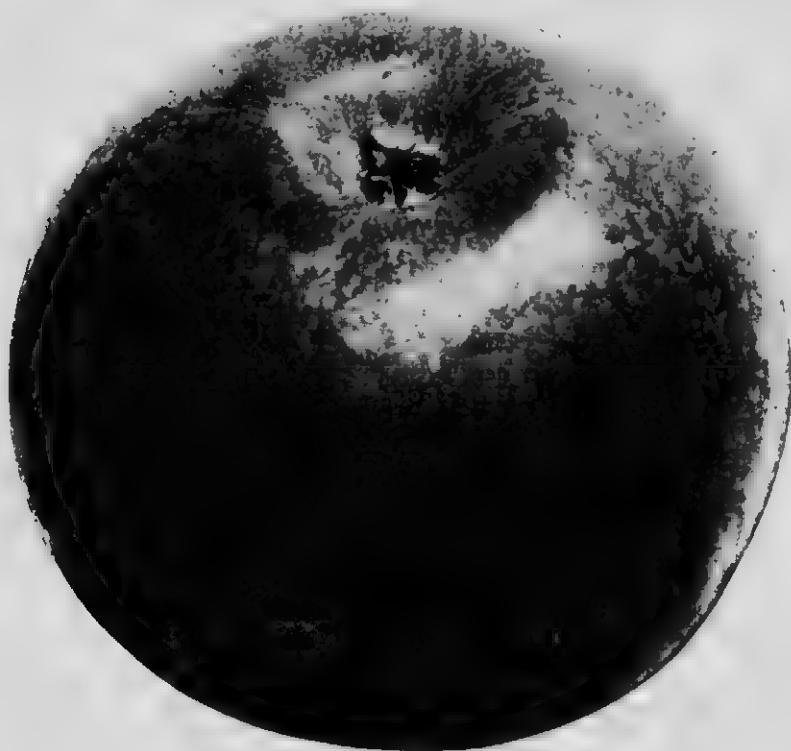
BLUE PEARMAIN.

A variety found in the old Canadian orchards, not productive enough to be profitable.

ORIGIN: uncertain; Beach says it has been planted in the elevated regions of New York and New England during the last 75 years; and Kenrick mentions it as common about Boston early in the nineteenth century.

TREE: strong, vigorous, healthy, hardy; not very productive.

FRUIT: size very large; form roundish, regular, slightly



BLENHEIM.



SECTION OF BLENHEIM.

conical; color splashes and stripes of dark purplish red over a dull yellow ground, solid red in sun, with heavy white bloom and distinct white russet dots; stem three-quarters of an inch long, set in a wide deep cavity; calyx open, in a smooth shallow basin.

FLESH: color yellowish; texture firm, moderately juicy; flavor mildly acid, rich, aromatic.

QUALITY: good.

COMMERCIAL VALUE: not profitable because of its unproductiveness.

SEASON: October to February.

BLUSHED CALVILLE.

Hardy and desirable at the north as a very early apple.

FRUIT: medium, conical, angular, ribbed; surface yellowish white, with slight blush; dots white, minute, suffused, obscure; basin broad corrugated; calyx closed, cavity often wavy, often green, sometimes slightly russeted; stem long. Core wide open, clasping; cells large, slit; tube broad conical; stamens medium.

FLESH: white, fine grained, juicy, good.

SEASON: early summer. (Hansen.)

This is a Russian apple; Caston (Simcoe County, Ontario) considers it of little value. Beach says it is not recommended for planting in New York State.

BOGDANOFF.

A promising apple for the north, where Spy and Baldwin are not hardy.

ORIGIN: Russia.

TREE: vigorous, upright, hardy.

FRUIT: size medium; form roundish, somewhat ribbed; color green or yellowish green, often with faint bronze blush and numerous small white dots; stem short, set in a shallow cavity; calyx in a broad, deep, plaited basin.

FLESH: color white; texture tender and juicy; flavor pleasant, subacid.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: second class.

SEASON: November to February.

BOIKEN.

A desirable hardy commercial variety, of very attractive appearance; Beach finds it resistant to the scab.

ORIGIN: Russia; named after Dike-Warden Boike of Germany.

TREE: a fair grower; habit willowy, like Golden Russet; an early and abundant bearer; hardy.

FRUIT: size medium; form oblate conical; skin smooth, yellow with red cheek and many minute white dots; stem long, in a wide, deep cavity; calyx in a wide wrinkled basin of moderate depth.

FLESH: color white; texture firm, juicy, fine grained; flavor sprightly, refreshing, subacid.

QUALITY: dessert fair; cooking very good.

COMMERCIAL VALUE: first class; stands storage well.

SEASON: November to February; holds well into May in cold storage.

BOROVINKA.

So closely does this Russian resemble the Duchess, that a separate description would be superfluous; although some growers plant it as an improved Duchess.

SEASON: August.

BOTTLE GREENING.

An apple grown in some parts of Ontario for home uses, for which its excellent quality makes it very desirable; not recommended for the commercial orchard because the skin is tender and shows bruises plainly.

ORIGIN: borders of Vermont and New York States; name from there being a hollow in the original tree in which the workmen were accustomed to keep their bottle.

TREE: vigorous, productive.

FRUIT: medium to large; form oblate, slightly conical; color yellowish with bright red on one side, a thin bloom and a few light dots; stem one-half inch long in a deep funnel form cavity; calyx nearly closed, in a moderately deep, slightly plaited basin.

FLESH: greenish white; texture fine, tender, juicy, almost melting; flavor subacid.

QUALITY: dessert very good.

COMMERCIAL VALUE: near market first class; distant market second class.

SEASON: November to February.

BOUGH.

(*Sweet Bough; Large Yellow Bough of Downing.*)

An excellent dessert apple, ripening about the same season as the Early Harvest; not subject to scab and a favorite with those who prefer a sweet to a sour apple. Not profitable to grow for market, but it deserves a place in every collection for home use.

ORIGIN: United States.

TREE: of medium vigor, never attaining a large size, and therefore, even with a full crop, not very productive; a biennial bearer.

FRUIT: large, ovate, conical; skin smooth, greenish yellow; stem one inch long, in a narrow, deep, regular cavity; calyx open, in a shallow, irregular basin.

FLESH: color white; texture fine grained, tender and juicy; flavor moderately sweet, rich and agreeable.

QUALITY: dessert very good; cooking only fair, lacks tartness; excellent for baking whole.

COMMERCIAL VALUE: second class.

SEASON: late July to middle August.

BRIER.

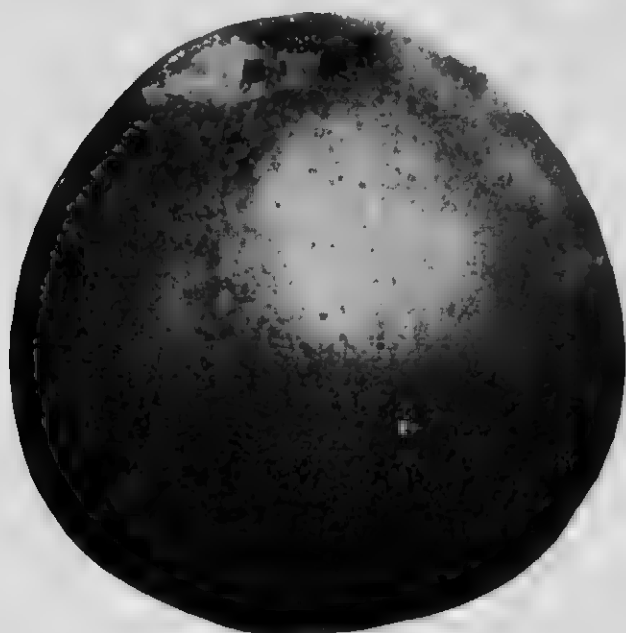
A crab originating with B. B. Brier, Baraboo, Wis.; seed of Siberian fertilized with Bailey Sweet; desirable for dessert or preserves.

TREE: hardy, vigorous, productive.

FRUIT: as large as Transcendent; form roundish, regular, flattened at ends; color yellow, mostly covered thinly with dotted and mixed red, obscurely splashed and striped and overlaid with whitish; dots obscure, few, minute, whitish; cavity wide, regular, obtuse, with some stellate russet; stem medium to long; basin flat, corrugated; calyx open; segments long divergent.

FLESH: whitish, crisp, juicy, very sweet.

SEASON: September to October. (Hansen.)



ROUGH.



SECTION OF ROUGH.

BRUNO.

A promising seedling of Scott Winter, raised at Central Experimental Farm, Ottawa.

FRUIT: above medium; oblate; cavity medium depth and width; stem short, moderately stout; basin deep, medium width, wrinkled; calyx closed; color greenish yellow, well washed with dark orange red, and purplish red; dots few, pale, indistinct; skin moderately thick, tender.

FLESH: white, crisp, tender, juicy; core medium; flavor subacid, pleasant.

QUALITY: good.

SEASON: November to January (C. E. F. Report, 1908).

BULLOCK.

This apple was grown for many years by the writer, at Grimsby, Ontario, under the misnomer of Red Russet. In some quarters it has been called American Golden Russet. It is an old New Jersey variety, well worthy a place in the amateur's home garden, for there is no late autumn dessert apple more delicious to precede the Snow. It has not proved profitable as a market apple.

TREE: moderately thrifty, shoots upright, dull reddish brown.

FRUIT: medium, roundish conical; color of skin greenish yellow to orange or golden, with more or less thin reddish russet, with bronze blush; cavity acute, regular; stem long, slender; basin shallow, narrow; calyx closed.

FLESH: yellowish, very tender, juicy, mild, rich, spicy, aromatic, almost sweet.

SEASON: October to December.

CABASHEA.

(Twenty Ounce Pippin.)

This apple has been often confused with the Twenty Ounce, or Cayuga Red Streak, a large showy apple of quite a different character; we, therefore, have adopted its synonym Cabashea. Not recommended because, though large and showy, the fruit drops early and the tree is unproductive.

TREE: vigorous, spreading, unproductive.

FRUIT: large, roundish oblate, slightly conical; skin yellowish green, shaded dull red on the sunny side; stem five-eighths of an inch long, stout, in a wide cavity of moderate depth; calyx open, in a wide, shallow basin; core medium.

FLESH: color white; texture firm, coarse; flavor subacid.

QUALITY: cooking fair; dessert useless.

COMMERCIAL VALUE: unprofitable because unproductive.

CANADA BALDWIN.

Said to have originated from seed of Pomme de Fer on the farm of Alexis Dery, St. Hilaire, Quebec. It was given its name by N. C. Fisk, Abbotsford, Que., who propagated it in 1855.

TREE: an upright strong grower; a light to medium, but annual bearer at Ottawa.

FRUIT: of medium size, roundish to slightly oblate; skin yellow, well washed, splashed and streaked with bright red and crimson; dots fairly numerous, large, yellow, prominent; cavity deep, open; stem short to medium in length, slender; basin medium in depth and width, slightly wrinkled; calyx closed or partly open.

FLESH: white, tinged with red almost to the core, rather coarse, firm, inclined to be corky, fairly juicy, mildly subacid, with a pleasant flavor; slightly astringent; core small.

QUALITY: good.

SEASON: midwinter. (Macoun.)

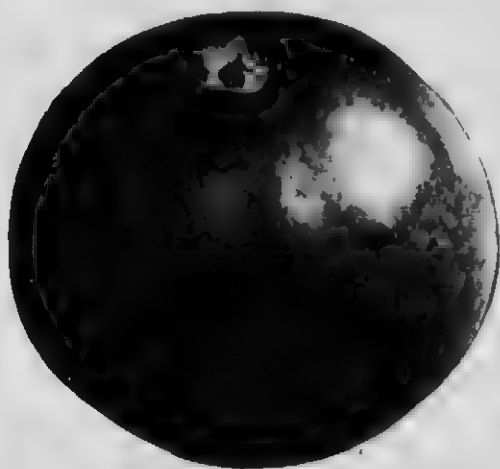
CANADA RED.

(*Red Canada of Beach.*)

ORIGIN: uncertain; Beach says it was brought into New York State from near Toronto, Ontario.

TREE: a strong grower, productive in some parts, a very shy bearer in others, therefore not recommended.

FRUIT: medium to large, roundish conical; skin yellow, well splashed and washed with deep, rather dull red; dots fairly numerous, large, yellow, prominent; cavity deep, narrow; stem short, slender; basin narrow, shallow, slightly wrinkled; calyx small, partly open.



CANADA RED.



SECTION OF CANADA RED.

FLESH: color yellowish; texture tender, moderately juicy; flavor mildly subacid, pleasant.

QUALITY: good.

COMMERCIAL VALUE: second class.

SEASON: mid to late winter.

CANADA REINETTE.

ORIGIN: doubtful; by some supposed to have originated in France; highly esteemed in Europe.

TREE: a strong, vigorous grower, spreading, open, productive.

FRUIT: very large, oblate conical, flattened, with prominent ribs originating at calyx and diminishing toward the stem; surface greenish yellow, with brown blush on sunny side, with numerous, russet patches; dots numerous, brown russety; cavity wide, deep, generally smooth; stem short, slender; basin rather deep, irregular; calyx open or closed; segments short.

FLESH: yellowish white, firm juicy, rich brisk subacid, very good to best.

SEASON: December to April. (Hansen.)

CAYUGA.

(Twenty Ounce, Cayuga Red Streak.)

A large, fine looking cooking apple, for late autumn; a good market sort; grown in limited quantities in Ontario.

ORIGIN: Connecticut.

TREE: vigorous, compact; productive, an annual bearer.

FRUIT: very large, roundish, surface uneven; skin greenish yellow to yellowish white, with marblings and stripes of red and crimson, and a few large gray dots; stem three-quarters of an inch long, in a deep slightly russeted cavity; calyx small, half open, in a smooth, shallow basin.

FLESH: color yellowish white; texture coarse grained, tender, moderately juicy; flavor brisk, subacid, pleasant.

QUALITY: dessert poor; cooking good.

COMMERCIAL VALUE: first to second class.

SEASON: late autumn to early winter.

CHARLAMOFF

(*Pointed Pipka, Arabka.*)

One of the best hardy varieties of its season for cold districts.

ORIGIN: Russia; imported by Chas. Gibb.

TREE: very hardy; habit spreading; growth vigorous; very productive.

FRUIT: size above medium; form oblong, truncated, angular, ribbed; skin light yellow, covered with dark crimson stripes and splashes, with red cheek and white minute dots; stem medium stout, in a deep acute russet cavity; calyx closed, in a wide, shallow wrinkled basin.

FLESH: color white, stained with red under the skin; texture somewhat coarse, juicy; flavor subacid, pleasant.

QUALITY: dessert good.

COMMERCIAL VALUE: second class, being very perishable.

SEASON: August.

CHENANGO.

(*Sherwood's Favorite.*)

A favorite autumn dessert apple, both for its appearance and excellent quality.

FRUIT: medium to large, oblong conic, regular, truncated, obscurely ribbed; surface yellowish white, mostly covered with rosy crimson stripes, mixed on sunny side and in part thinly overlaid with whitish net veining; dots distinct, white, few, minute; cavity regular, acute, narrow, somewhat uneven; stem very short, small; basin narrow, shallow, nearly or quite smooth; calyx closed or half open; segments erect, convergent; core rather large, half open; seeds flat, pointed.

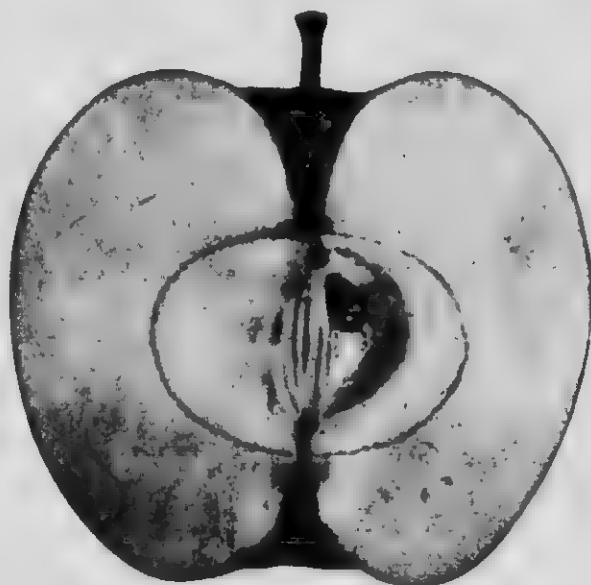
FLESH: white, tender, juicy, mild, pleasant subacid, very good.

SEASON: September, October. (Hansen.)

ORIGINATED at Lebanon, New York State; succeeds well in Ontario.



CHARLAMOFF.



SECTION OF CHARLAMOFF.

CLIVE.

A very handsome apple; a seedling of Wealthy raised at C. E. F., Ottawa; resembles Wealthy, superior in quality.

FRUIT: large; roundish, regular; cavity deep, medium width; stem short, stout; basin deep, open, almost smooth; calyx partly open; color pale greenish yellow, well washed with rich crimson; dots moderately numerous, small, whitish, indistinct; skin moderately thick, moderately tender.

FLESH: dull white, rather coarse, firm, crisp, moderately juicy; core medium; flavor subacid, good, pleasant.

QUALITY: good.

SEASON: October and November. (C. E. F. Report.)

COLVERT.

A fairly good fall market apple, of good size and appearance, but of only fair quality and inclined to waste by dropping before full maturity; inferior to the Gravenstein.

TREE: hardy, vigorous and productive.

FRUIT: large; form oblate, slightly conical; skin greenish yellow, with cheek and faint stripes of dull red; stem stout one-half inch long.

FLESH: color greenish white; texture tender, moderately juicy; flavor subacid, ordinary.

QUALITY: dessert poor; cooking fair.

COMMERCIAL VALUE: second class.

SEASON: October and November.

COOPER MARKET.

An attractive, marketable winter apple grown many years in the Niagara district, Ontario, but scarcely productive enough to be profitable. Hansen describes it as follows:

FRUIT: small to medium, round oblate, conic; surface greenish yellow, heavily shaded with purplish red and striped with crimson; dots few; cavity deep, narrow; stem short to medium; basin small, shallow, slightly irregular; calyx closed; core medium, somewhat open.

FLESH: white, tender, brisk, subacid, good.

SEASON: December to May.

COO'S RIVER BEAUTY.

A handsome apple, and promising for the best apple districts. Samples from W. H. Dempsey, Trenton, Ont.

FRUIT: medium to large size; form oblate; cavity deep, open, lightly russeted; stem very short, slender; basin deep, medium width, almost smooth, calyx open; color pale yellow, well washed with bright crimson; dots few, yellow, distinct; skin moderately thick, tough.

FLESH: white, crisp, tender, juicy; core medium; subacid, sprightly, pleasant flavor; quality good to very good.

SEASON: early to midwinter. (Macoun.)

CORNISH GILLYFLOWER.

An old English dessert apple commended for British Columbia by Thos. Sharpe, of Agassiz.

ORIGIN: in a cottager's garden, near Truro, England; first exhibited before London Horticultural Society in 1813.

TREE: a fair grower and regular bearer.

FRUIT: of medium size and very uniform, skin russet yellow, with fine blush.

FLESH: yellowish, crisp, fine grained, juicy, with a rich flavor.

SEASON (British Columbia): November to February.

COX'S ORANGE.

One of the best of English dessert apples, and well suited to be grown as a dwarf tree on Paradise stock. It is not planted commercially in Ontario, but is found to succeed well in British Columbia.

ORIGIN: England; raised by Mr. Cox, of Buckinghamshire, in 1830, from seed of Ribston.

FRUIT: size medium; form roundish ovate, even and regular; skin greenish yellow, and streaked with red in the shade, but dark red where exposed to the sun, and this extends over three-quarters of the whole surface. Over the colored part are patches and traces of ash gray russet forming a smooth, firm crust. Eye (calyx), small and open, or closed, filled with stamens and with short erect segments, set in a somewhat shallow, saucer-like basin which is plaited and entirely lined with russet. Stamens

medium; tube funnel shaped; stalk one-half inch long, somewhat fleshy, set in a moderately deep cavity, which has a slight swelling on one side, and is covered with russet extending over the base.

FLESH: yellowish, very tender in the grain, crisp, juicy and sweet, with a fine perfume and rich flavor. (Hogg.)

SEASON (England): October to February.

CRANBERRY PIPPIN.

In localities where this apple grows to perfection it is a desirable export variety to put up in boxes; the quality is ordinary and the surface is sometimes subject to warts, yet it is a large finely colored apple, and presents a remarkably attractive appearance when opened up in midwinter, the red streaks being set off by the deepening yellow of the skin.

ORIGIN: accidental, on a farm near Hudson, N.Y.

TREE: very vigorous, spreading, moderately productive.

FRUIT: medium to large, roundish oblate; skin smooth, yellow, splashed and striped with two shades of red; stem slender, one-eighth inch long in a deep cavity; calyx closed, in a wide, wrinkled basin.

FLESH: color white; texture firm, crisp, coarse, moderately juicy; flavor subacid.

QUALITY: dessert poor; cooking fair.

COMMERCIAL VALUE: first to second class.

SEASON: December to March.

CRIMSON BEAUTY.

A local apple which, according to R. W. Starr, of Nova Scotia, is coming into favor in the Annapolis Valley for home use and for local markets, being earlier than the Astracan.

ORIGIN: New Brunswick, by F. P. Sharpe, Woodstock, N.B.; described as follows by W. T. Macoun in his Report for 1909:

FRUIT: below medium size; roundish to oblate; cavity deep, open; stem long, slender; basin open, deep to medium; calyx closed; yellow well washed and splashed with bright red; dots obscure; skin thin, tender.

FLESH: white tinged with red, moderately juicy; core medium; acid; medium quality.

SEASON: evidently mid August.



CRANBERRY PIPPIN.



SECTION OF CRANBERRY PIPPIN.

CROSS.*(Large Anis.)*

ORIGIN: Russia.

FRUIT: medium to large; form regular, oblate; skin yellow, mostly covered with mixed dark, red and crimson splashes and stripes; dots minute, white, obscure; cavity regular, with a radiating patch of russet; stem short; basin wavy, abrupt, with fine wrinkles; calyx half open.

FLESH: white, pleasant subacid, good.

SEASON: late fall. (Thomas.)

DARTT.

One of the best of the hybrid crabs.

ORIGIN: Minnesota, by E. H. S. Dart, from seed of Tetofsky.

FRUIT: large (for crab); form conical, very regular; skin yellow, mostly covered with bright red stripes and splashes, mixed on sunny side, a handsome fruit; dots white, obscure; cavity regular, deep, acute, with trace of russet; stem long; basin flat, corrugated; calyx closed; segments large, long.

FLESH: white, juicy, subacid, good.

SEASON: September. (Hansen.)

DELICIOUS.

Originated in Iowa; reported favorably from Pacific Coast. The following description was given by the United States Division of Pomology:

TREE: a regular and heavy bearer.

FRUIT: large roundish conic, ribbed; skin medium thick, tenacious; surface smooth, except the ribbing; color yellow, washed with mixed red, splashes and broken stripes of bright crimson; bloom whitish; dots numerous, small, yellow, some indented; cavity regular, large, deep, gradual, russet; stem medium stout; basin regular, large, deep, gradual, furrows and knobs; eye medium, closed.

FLESH: yellow; texture fine, tender, juicy; flavor subacid, very pleasant; quality good to very good.

SEASON: early winter.

DETROIT.

(Black Detroit, Red Detroit.)

This fruit, commonly known in Western New York, Michigan (and Canada) as the Detroit, is supposed to have been brought to the neighborhood of Detroit by early French settlers, and thence disseminated.

FRUIT: of medium or rather large size, roundish, somewhat conical, bright crimson at first but becoming dark blackish purple at maturity, somewhat dotted and marbled with specks of fawn color on the sunny side.

FLESH: white (sometimes stained with red to the core in exposed specimens), crisp, juicy, of agreeable, sprightly subacid flavor. Good.

SEASON: October to February. (Downing.)

As grown in Canada the Detroit has no commercial value; the fruit is uneven in size and quality, some samples perfect, but many blemished, and much of it drops prematurely. Some value it highly for dessert purposes.

DODD.

An apple of the Gravenstein type which appears to do well on Prince Edward Island. It is described as follows by W. T. Macoun in his Report for 1909:

FRUIT: above medium size; oblong; cavity shallow, medium width; stem short, stout, sometimes lipped; basin medium depth and width, almost smooth; calyx open; yellow, splashed and streaked with bright crimson; dots obscure; skin moderately thick, tender.

FLESH: white, crisp, tender, juicy; core medium; subacid, pleasant flavor; quality good.

SEASON: midwinter.

DOMINIE.

A sprightly, juicy, winter apple, in appearance resembling Rambo.

ORIGIN: New York State.

TREE: upright, vigorous, productive, an early bearer.

FRUIT: rather large, regular, oblate; color greenish yellow in shade, mostly covered with splashed and striped bright red in the sun, overlaid with a whitish shade; dots distinct, many, very large, some scattered irregular russet specks with light bases; cavity regular, very wide and deep, with large stellate russet patch; stem medium, rather slender, curved; basin wide, medium deep, slightly ribbed; calyx closed.

FLESH: whitish, very tender, juicy, pleasant, rich, sprightly subacid; very good.

SEASON: December to April. (Hansen.)

DUCHESS.

Oldenburg (of Amer. Pomol. Soc.); Borovitsky (of Royal Horticultural Soc.)

The most popular and profitable commercial apple of its season; succeeds in every part of Canada where the apple can be grown, and its beauty brings it the top prices in the markets; can be exported in boxes in cold storage.

ORIGIN: Taurida gardens, St. Petersburg, Russia, 1824; and thence introduced into England by the Royal Hort. Soc.

TREE: very vigorous; very hardy; an early and an abundant bearer.

FRUIT: medium to large; form regular, roundish oblate, one-sided; skin greenish yellow, with bright red stripes, splashes and numerous russety dots; stalk slender three-quarters of an inch long, set in a deep, funnel-shaped cavity; calyx long closed, in a deep, broad, plaited basin.

FLESH: greenish, turning yellowish white at maturity; texture fine, firm and juicy; flavor brisk, refreshing acid.

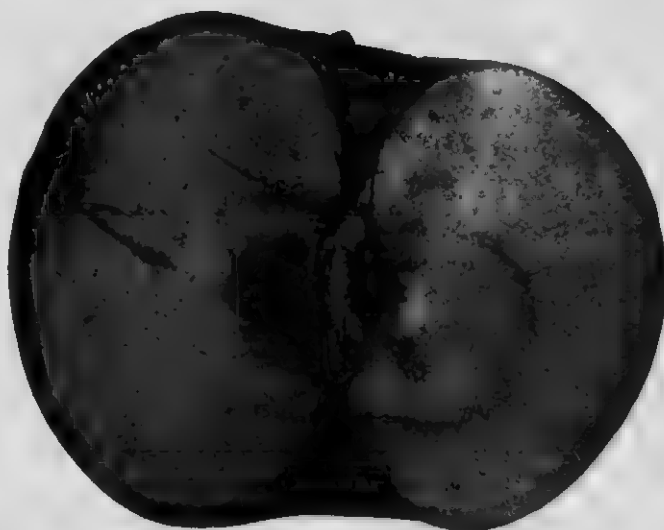
QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: first class.

SEASON: August, September.



DUCHESS.



SECTION OF DUCHESS.

DUDLEY.*(North Star.)*

ORIGIN: Maine; seedling of Oldenburg by J. W. Dudley.

FRUIT: large, regular, roundish oblate; surface smooth, yellow, mostly covered with bright rose crimson stripes and splashes, coloring nearly solid on sunny side, with thin bluish bloom; cavity regular, wide, obtuse, with trace of stellate russet; stem long; basin deep, abrupt, corrugated and ribbed; calyx closed.

FLESH: yellow, white inside the core outline, fine-grained pleasant subacid, very good.

SEASON: late fall and early winter. (Am. Hort. Manual.)

DYER.*(Pomme Royal.)*

An old French variety.

TREE: a fair grower; an annual and early bearer, but the thin skin of the fruit prevents distant shipping without bruising.

FRUIT: medium to large; form roundish, somewhat flattened, obscurely ribbed; surface smooth, clear, greenish yellow, with rarely a faint blush, and with more or less thin, russet, net veining; cavity regular, deep; stem medium; basin medium, abrupt, ribbed; calyx closed; segments long, divergent.

FLESH: yellowish white; texture very tender and juicy; flavor spicy, rich aromatic, sprightly subacid. (Hansen.)

QUALITY: dessert excellent.

SEASON: October to December.

EARLY HARVEST.

The best apple of its season for dessert and at one time freely planted in the older provinces of Canada for market purposes, but of late years much subject to scab, which lessens its size and

impairs its appearance. Unless this fungus can be controlled by spray mixtures, it must be omitted entirely from our commercial list.

ORIGIN: United States, early in the 19th century.

TREE: only medium in vigor, never attaining a very large size, compared with trees of Greening; habit spreading; fairly productive, full grown trees yielding about four barrels each alternate year.

FRUIT: medium, round, oblate; skin smooth, bright straw color when ripe, with a few faint dots; stem short, one-half to three-quarters of an inch, in a medium cavity, often russeted; calyx closed, in a shallow, sometimes slightly plaited basin.

FLESH: color white; texture fine, tender, crisp, juicy; flavor rich, sprightly, pleasant subacid.

QUALITY: dessert best; cooking good.

COMMERCIAL VALUE: second class.

SEASON: late July and August.

EARLY JOE.

Valuable only for the home orchard; much of the fruit is undersized and otherwise unmarketable.

ORIGIN: in orchard of H. Chapin, East Bloomfield, N.Y., first exhibited in 1843.

TREE: slow grower; needs good soil and cultivation; an early and a biennial cropper.

FRUIT: small to medium; regular oblate conic, somewhat ribbed, rather symmetrical; stem medium to long; cavity acute, shallow to medium in depth, rather broad, symmetrical, sometimes thinly russeted; calyx medium size, closed or slightly open; basin small to medium, usually shallow, medium width, somewhat cupped; skin tender, thin, pale greenish yellow, striped and splashed with dull dark red.

FLESH: tinged with yellow; texture fine, crisp, very tender, very juicy; flavor mild, subacid; very good to best.

SEASON: August and September. (Beach.)

EARLY STRAWBERRY.

A beautiful variety, which is said to have originated in the neighborhood of New York and appears in the markets there from July until September.

FRUIT: medium, roundish, narrowing toward the eye. Skin smooth and fair, finely striped and stained with bright and dark red, on a yellowish white ground. Stalk an inch and a half long, rather slender and uneven, inserted in a deep cavity; calyx rather small in a shallow, narrow basin.

FLESH: white, slightly tinged with red next the skin, tender, subacid and very sprightly and brisk in flavor, with an agreeable aroma; very good. (Downing.)

Since the introduction of the Astracan and the Duchess, the Early Strawberry has not been in demand in Ontario and we do not recommend it to planters in this province. In colder sections, where only crabs are hardy, it may be desirable. Chas. Gibb, of Quebec, said of it in 1885: "It is of small size, but nothing that I grow equals it in quality. It has no astringency."

ENGLISH RUSSET.

The English Russet is a valuable long keeping variety extensively cultivated and well known by this name, but which we have not been able to identify with any English sort. It is not fit for use until February, and may be kept till July, which, together with its great productiveness and good flavor, renders it a very valuable market fruit. The trees grow very straight and form upright heads, and the wood is smooth and of a reddish brown.

FRUIT: of medium size, roundish, slightly conical, and very regularly formed. Skin pale greenish yellow, about two-thirds covered with russet, which is thickest near the stalk. Calyx small, closed and set in an even round basin, of moderate depth. Stalk rather small, projecting even with the base and pretty deeply inserted in a narrow, smooth cavity.

FLESH: yellowish white, firm, crisp, with a pleasant, mild, slightly subacid flavor. Good.

SEASON: January to May. (Downing.)

EXCELSIOR.

A seedling of Wealthy, originated by Peter M. Gideon, of Minnesota, about 1888.

TREE: vigorous, upright, spreading.

FRUIT: very large for a crab, nearly as large as a medium-sized apple, roundish, oblate; stem rather long and slender, sometimes bracted and inserted in a narrow rather shallow cavity; calyx rather large, closed, set in a shallow, broad plaited basin; skin smooth yellow, sprinkled with numerous russet dots, and shaded or splashed with red over much of its surface; handsome in appearance.

FLESH: white, not fine grained, firm, juicy, subacid, with crab apple flavor; good to very good in quality. Begins to ripen about the first of September. (Beach.)

FALLAWATER.

A large apple, of regular form and attractive appearance, grown in the older commercial orchards on the north shore of Lake Ontario and east shore of Lake Huron and ranked first class by some growers; but not much planted in the newer orchards, perhaps because not uniformly productive.

ORIGIN: Pennsylvania.

TREE: a vigorous grower; fairly productive.

FRUIT: size large to very large; form round, regular, smooth; color pea green, shaded on sunny side with brownish red cheek; dots sparse, large, light green; stem one-half inch long, stout, set in a narrow, moderately deep cavity; calyx small, nearly closed in a shallow, wrinkled basin.

FLESH: greenish white; texture fine grained, firm, moderately juicy; flavor mild subacid, fair.

QUALITY: cooking good; dessert poor.

COMMERCIAL VALUE: first class.

SEASON: January to March.



FALLWATER.



SECTION OF FALLWATER.

FALL PIPPIN.

A general favorite as a fall cooking apple, and possessing fairly good flavor as a dessert apple; freely planted in Ontario apple orchards at one time, but discarded of late years because of its liability to apple scab.

ORIGIN: United States.

TREE: stout, vigorous, spreading; fairly productive; long lived, some trees in the Niagara district, Ontario, being over one hundred years of age.

FRUIT: large; form roundish, sometimes obscurely ribbed; skin yellow, often with red cheek and a few small gray dots; stalk one-half to three-quarters of an inch long, set in a small, moderately deep cavity; calyx small, open, in a small, moderately deep basin.

FLESH: greenish white; texture tender, mellow and fairly juicy; flavor brisk, pleasant, aromatic.

QUALITY: dessert fair; cooking best.

COMMERCIAL VALUE: second class.

SEASON: November, December.

FAMEUSE.

(*Snow; Pomme de Neige.*)

The most highly valued of all table apples, and, but for one fault, the most profitable, especially in eastern Ontario and certain parts of Quebec, where it attains its highest perfection. The fault is its liability to the scab, which possibly may be kept in check by copper or sulphur sprays.

ORIGIN: Quebec, probably from seeds brought from France; called Fameuse, the French for famous; Snow and Pomme de Neige from the color of its flesh.

TREE: moderately vigorous; hardy; moderately productive.

FRUIT: medium size, roundish; skin light green, striped and shaded with two shades of red, often nearly covered with deep red; stalk slender, one-half inch long, in a small deep cavity; calyx small, segments often recurved, in a shallow slightly plaited basin.

FLESH: snow white, texture tender, very fine grained, breaking, juicy; flavor aromatic.



FAMEUSE.



SECTION OF FAMEUSE.

QUALITY: dessert best; cooking fair, excellent for jellies.

COMMERCIAL VALUE: first class.

SEASON: October to December.

FAMEUSE SUCRÉE.

A handsome and excellent dessert apple.

ORIGIN: Montreal.

FRUIT: nearly medium, roundish oblate, rich, red.

FLESH: delicate, very good.

SEASON: autumn. (Thomas.)

FANNY.

ORIGINATED near Strasburg, Lancaster Co., Pa., U.S.

TREE: vigorous, spreading, and productive.

FRUIT: above medium size, roundish to oblate, slightly conical; skin yellow, heavily splashed and washed with deep red; dots few, yellow and not prominent; cavity deep, moderately open; stem short, slender; basin of medium depth, narrow, almost smooth; calyx partly open.

FLESH: white, crisp, tender, juicy, subacid; core small; quality good.

SEASON: September. (Macoun.)

FILLBASKET.

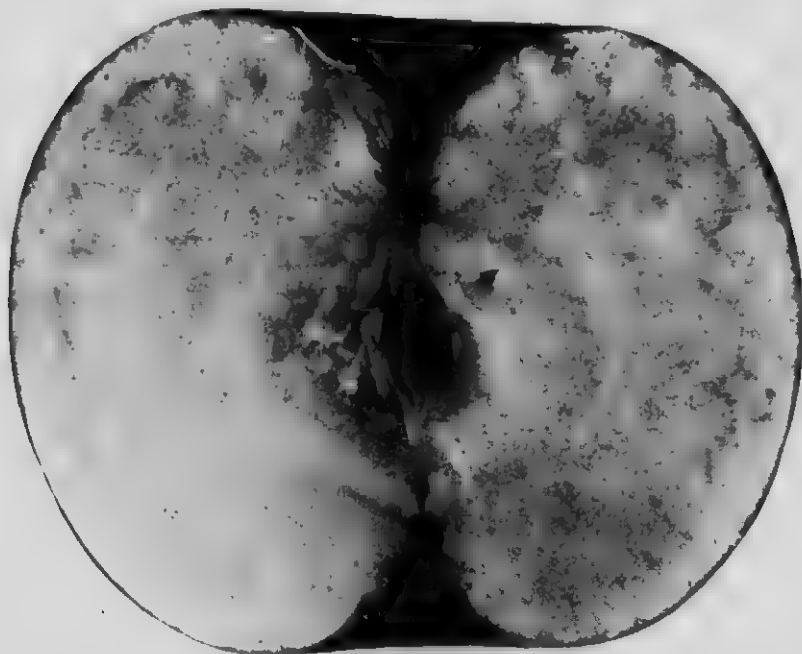
(*Kentish Fillbasket.*)

An old English variety of great beauty of appearance and enormous size, often exceeding four inches in diameter. It is not, however, much grown in Canada, being a fall apple, perishable and of ordinary quality.

TREE: vigorous, fairly productive.

FRUIT: very large, globular, slightly ribbed; color smooth, shiny, light green or pale yellow, sometimes almost white and on sunny side splashed and striped with bright red; stem stout, short, one-quarter inch long, set in a large cavity; calyx closed, in a large plaited basin.

FLESH: fine grained, tender and juicy; flavor mild, subacid.
QUALITY: poor for dessert; good for cooking.



SECTION OF FILLBASKET

COMMERCIAL VALUE: second class.
SEASON: October to December.

FLORENCE.

One of the best crabs for market. Originated by Peter M. Gideon, Excelsior, Minn.

FRUIT: medium, oblate, nearly regular, obscurely ribbed and uneven; surface polished and waxy; yellowish white, mostly covered with brilliant, solid crimson, somewhat mottled on shady side, a beautiful fruit; dots few, minute, white, very obscure; cavity deep, regular slightly russeted; stem long; basin flat, minutely wrinkled; calyx closed; segments divergent, long.

FRESH: yellowish white, tender, very crisp and juicy, brisk subacid, good.

SEASON: September. (Hansen.)

FLUSHING.

(*Flushing Spitzenberg.*)

ORIGIN: United States.

TREE: young shoots reddish brown, quite unlike the yellowish shoots of *Esopus Spitzenberg*.

FRUIT: medium, regular, roundish conical; color yellow, mostly covered with mixed dark red, overlaid with whitish; dots distinct, numerous, minute, russet; cavity deep, wide, regular, obtuse, some radiating russet; stem medium; basin very shallow, wide, with many small corrugations and ribs; calyx open.

FLESH: white; juicy, pleasant, nearly sweet, good.

SEASON: October to February. (Hansen.)

GANO.

ORIGINATED in Missouri and is said to be a seedling of Ben Davis.

TREE: a fairly hardy, upright, strong grower and an annual and good bearer.

FRUIT: above medium size, roundish conical; skin yellow, almost completely overspread with crimson, not splashed or streaked as Ben Davis; dots gray, obscure; cavity of medium depth and width; stem short; basin of medium depth and width, slightly wrinkled; calyx open.

FLESH: dull white, somewhat tenderer than Ben Davis, moderately juicy, mildly subacid, has no characteristic flavor; core medium; quality medium, but little, if any, better than Ben Davis.

SEASON: late winter.

This is a very handsome apple, being more highly colored than Ben Davis as grown at Ottawa. (Macoun.)

GARNER.

A seedling of Langford Beauty, originated at Central Experimental Farm, Ottawa.

FRUIT: above medium in size; oblate; cavity deep, medium width, russeted; stem medium to long, slender; basin medium to open, deep, wrinkled; calyx closed; color pale greenish yellow, washed and splashed with dark crimson; dots few, yellow, distinct; skin moderately thick, tender.

FLESH: white, firm, juicy; core medium; flavor subacid, pleasant; quality good.

SEASON: September, October. (C. E. F. Report.)

GIBB.

ORIGINATED by the late Geo. P. Pepper, Wisconsin, by crossing yellow Siberian crab with pollen of Fall Green apple.

FRUIT: large, roundish oblate, very regular; surface rich orange yellow, blushed on sunny side with a little thin net veining of russet, a beautiful fruit; dots white minute; cavity regular; stem medium long; basin shallow, wide, often wrinkled around the eye; calyx open.

FLESH: a rich orange yellow, juicy, pleasant acid.

SEASON: September. (Hansen.)

GIDEON.

A very pretty apple but inclined to rot at the core.

ORIGIN: Minnesota, by P. M. Gideon.

TREE: vigorous; hardy; holds fruit well; productive; proof against sun scald.

FRUIT: large, round or slightly conical; skin white with bright red cheek shaded with deeper red splashes; dots white, obscure; cavity broad, deep, regular or slightly corrugated; stem one inch long, slender; calyx half-closed in a small corrugated basin.

FLESH: white, flaky, tender, almost melting, yet crisp, fine, juicy and of good flavor.

QUALITY: dessert poor; cooking fair.

COMMERCIAL VALUE: second to third class.

SEASON: October to November.

GILLYFLOWER.

(*Black Gillyflower of Beach.*)

Very productive, and by some called a profitable market fruit.

FRUIT: medium size, oblong, conical; skin very dark dull red.

FLESH: white, dry, mild, subacid; good.

SEASON: November to February. (Downing.)

Known in Connecticut in latter part of 18th century. (Manning.)

Profitable to grow in limited quantities for southern markets. The apples grow fair and smooth and there is little loss from unmarketable fruit. (Beach.)

GIPSY GIRL.

Mr. W. T. Macoun, of C. E. F., Ottawa, finds this apple to be identical with Titovka.

GLASS.

(*Glass Green.*)

Succeeds in Manitoba.

ORIGIN: Russia.

FRUIT: so nearly resembles Duchess that it is thought to be identical.

GLORIA MUNDI.

(*Monstrous Pippin.*)

A good cooking apple; remarkable for its very large size, but not being planted in the commercial orchards of Canada.

TREE: a very vigorous grower; not very productive; trees one hundred years of age were still bearing fruit in 1909, in the orchards of Mr. L. Woolverton, Grimsby.

FRUIT: size very large; form roundish, somewhat flattened at the ends, slightly angular or ribbed; skin smooth, whitish green, becoming whitish yellow; stalk stout, short; calyx large; basin wide, deep, somewhat ribbed, with an obtuse rim.

FLESH: white; texture tender, rather coarse; flavor subacid, not rich.

SEASON: late autumn and early winter. (Thomas.)

GOLDEN.

Dr. Saunders' hybrid crab; *Pyrus prunifolia* with 'Golden Russet.

TREE: a fair grower and quite productive.

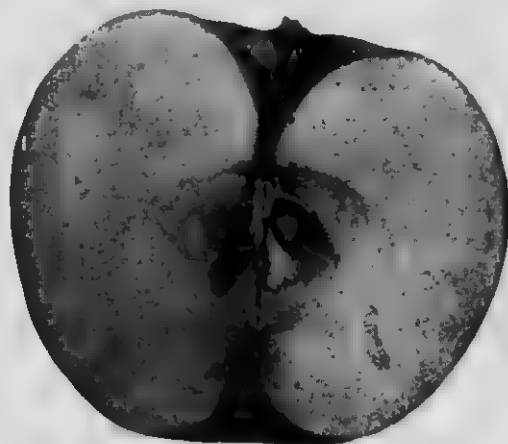
FRUIT: size 1.5 inches across, 1.2 inches deep, round, somewhat flattened at the ends; calyx persistent in a shallow basin; stem one-half inch long, rather stout; color bright yellow with a faint tinge of red.

FLESH: color yellowish white; texture crisp, juicy; flavor mildly subacid, not astringent, good.

SEASON: late in September.

GOLDEN RusSET.

This is the Golden Russet of Western New York, sometimes incorrectly called American Golden Russet, which is a tender-fleshed apple only keeping until January. Valuable in the colder sections of the apple belt, being comparatively hardy and the fruit of high commercial value; in the warmer sections it is considerably grown in the older orchards, but not so much planted of late, being only medium size, and russet apples not quite as much in demand as formerly



SECTION OF GOLDEN RusSET.

TREE: fairly vigorous, shoots slender or willowy, speckled; habit irregular; productive alternate years.

FRUIT: medium size; form roundish, slightly oblong, slightly flattened; skin covered with thick russet, occasionally showing a patch of greenish yellow; stem slender, one-half to one inch long; not subject to scab.

FLESH: color yellowish, texture fine grained, firm, crisp; flavor aromatic, subacid.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: first class.

SEASON: keeps till May in cold cellar, but, if air is dry and warm, inclined to shrivel.

GOLDEN SWEET.

A celebrated Connecticut apple; valuable for cooking, market or stockfeeding.

TREE: very vigorous, spreading, forming a tree of moderate size, hardy and very productive.

FRUIT: above the medium size, roundish, scarcely flattened, fair and well formed; when fully ripe pale yellow or straw color. Stalk about an inch long, slender at its junction with the fruit. Calyx closed and set in a basin of moderate depth.

FLESH: tender, sweet, rich, excellent. Good to very good.

SEASON: August and September. (Downing.)

After growing this variety for a life time, we must now take exception to the statement that it is valuable for market. The fruit begins dropping while yet a dull green unattractive color, and must be harvested or be largely wasted; and there are so many finer market apples of its season that it is little wanted except by those who want a sweet apple for baking or stockfeeding.

GOLDEN WHITE.

A late fall apple.

ORIGIN: Russia.

FRUIT: large, roundish, somewhat tapering, sometimes angular; surface yellow, with dark crimson splashes, mixed and marbled; dots large, grayish white, distinct; cavity shallow, wide, with radiating patch of russet; stem medium; basin shallow, narrow, corrugated; calyx half open.

FLESH: yellowish white, pleasant subacid, good.

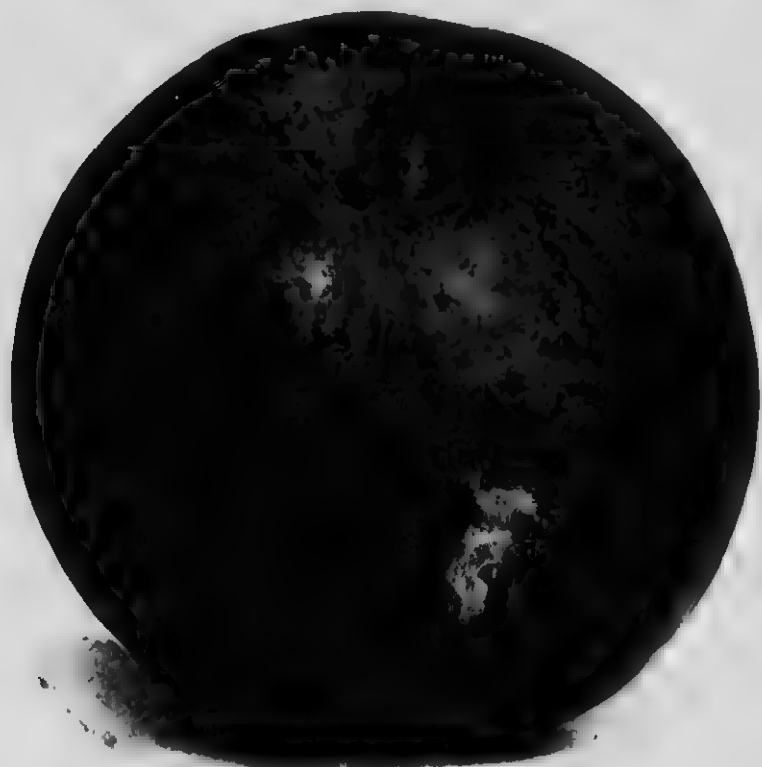
SEASON: late fall, between Oldenburg and Longfield. (Am. Hort. Manual.)

GRANBY.

A rather promising apple of handsome appearance; much like a large Scott Winter, but not so tender in flesh.

ORIGIN: Central Experimental Farm, Ottawa; McMahon x Scott Winter.

FRUIT: above medium; oblate to roundish, conic, somewhat angular; cavity narrow, deep, russeted; stem short, moderately stout; basin deep, medium width, wrinkled; calyx small, closed, color yellow, well washed and splashed with attractive



GRAVENSTEIN.



SECTION OF GRAVENSTEIN.

orange red; dots obscure; skin moderately thick, moderately tough; flesh dull white, tender, with traces of red, moderately juicy; core medium; briskly subacid, but not much flavor; quality above medium.

SEASON: December to late winter. (C. E. F. Report.)

GRAVENSTEIN.

A favorite commercial apple in Nova Scotia, but altogether too little cultivated in Ontario, considering its many excellent characteristics. It has no competitor of its season for either home use or market.

ORIGIN: according to Hogg, the original tree grew in the garden of the Duke of Augustenberg, at the castle of Graufenstein, Germany, and was still standing about 1850. The earliest trace of this apple dates back to about 1760.

TREE: much more vigorous in growth than ordinary varieties, and when in bloom remarkably beautiful with its extraordinary-sized pure white blossoms; hardy and productive.

FRUIT: large to very large; form oblate to conical, somewhat one-sided and more or less pentagonal; skin greenish yellow to orange, beautifully striped and splashed with two shades of red; stems stout, about half an inch in length, set in a deep narrow cavity; calyx partially closed, long wide segments set in a broad, irregular, slightly russeted basin.

FLESH: white; texture crisp and very juicy; flavor rich, vinous and aromatic.

QUALITY: dessert very good; cooking very good.

COMMERCIAL VALUE: first class.

SEASON: September and October.

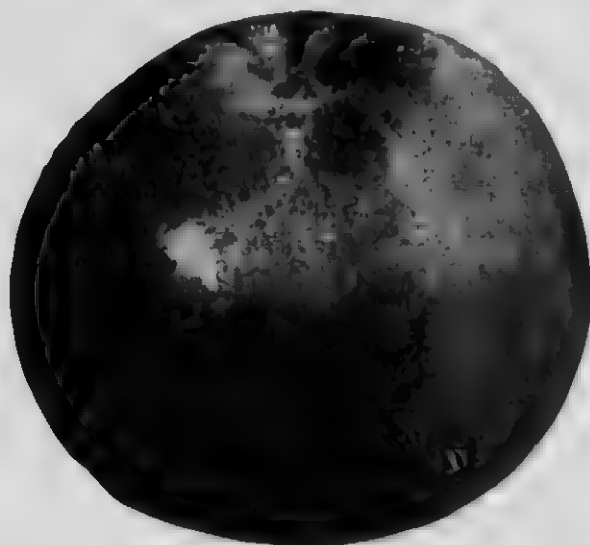
GREENING.

(*Rhode Island Greening.*)

One of the staple varieties for profit, especially in the older orchards in the southern parts of the Province of Ontario; of late years the fruit shows a tendency to scab and pink rot and therefore is losing popularity.

ORIGIN: Rhode Island.

TREE: very vigorous, spreading, a crooked grower; very pro-



GREENING.



SECTION OF GREENING.

ductive, a single tree sometimes yielding from ten to fifteen barrels of apples.

FRUIT: large roundish, sometimes a little flattened, regular unless overgrown; color green, becoming lighter as it ripens, often showing a blush where well exposed to the sun; dots light gray, numerous toward the apex; stem seven-eighths inch long in a smooth narrow cavity; calyx partly closed in a nearly smooth shallow basin.

FLESH: white, with a greenish tint, yellowing as it matures; texture fine grained, crisp, juicy; flavor rich, slightly aromatic, pleasant, subacid.

QUALITY: dessert fair; cooking best.

COMMERCIAL VALUE: best.

SEASON: December to February.

GRIMES.

(Grimes Golden Pippin.)

An apple that has a good reputation in some parts as a winter dessert apple, on account of its excellent quality and its rich golden color; not extensively planted in Canadian orchards.

ORIGIN: Virginia, on the farm of Thos. Grimes.

TREE: vigorous, branches knobbed at base; not hardy far beyond the north shore of Lake Ontario; a regular, annual bearer.

FRUIT: size medium; form roundish oblong; color rich golden yellow with russet dots; stem slender in a deep cavity; calyx partly closed in a deep, wrinkled, abrupt basin.

FLESH: yellow; texture firm, crisp, juicy; flavor rich aromatic, spicy, subacid.

QUALITY: dessert best; cooking poor.

COMMERCIAL VALUE: second class.

SEASON: December and January.

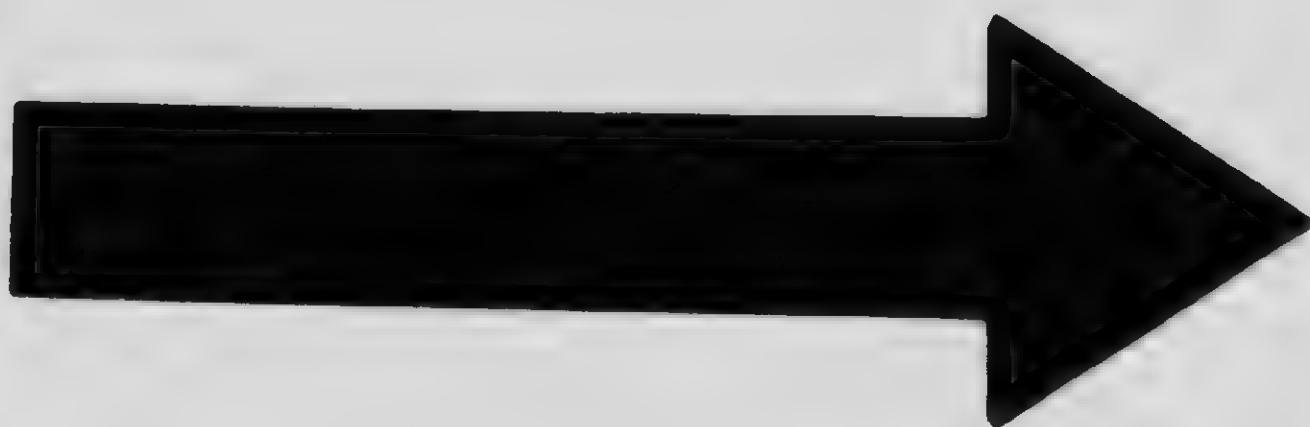
GRINDSTONE.

(American Pippin.)

Valuable chiefly for its long keeping, and for cider.

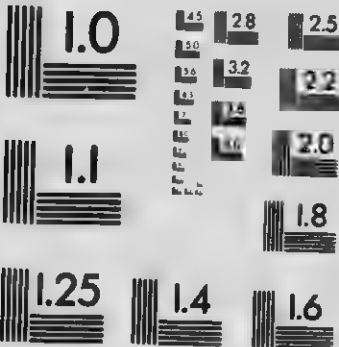
ORIGIN: United States.

TREE: hardy, vigorous, productive.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc.

1651 051 Main Street
Rochester, New York 14601 USA
(716) 482-0300 Phone
(716) 288-5989 Fax

FRUIT: size medium; form regular, roundish oblate; skin dull green, with patches and stripes of dull red and numerous dots; stem short, stout, in a deep slightly russeted cavity; calyx large, open, in a deep, medium sized, slightly wrinkled basin.

FLESH: color yellowish white; texture firm, crisp, not very juicy; flavor brisk acid.

QUALITY: dessert poor; cooking fair.

COMMERCIAL VALUE: second class.

SEASON: March to June.

HAAS.

(*Fall Queen.*)

At one time popular in the colder sections of the apple belt, because of hardness of tree, but now superseded by Wealthy.

ORIGIN: Missouri.

TREE: vigorous; upright; an early and an annual bearer; hardy.

FRUIT: size medium; form oblate, conical; skin thick; color yellow, marbled splashed and striped with crimson; dots few, obscure; stem short, in a broad, moderately deep cavity, slightly russeted; calyx half closed in an irregular, wrinkled basin.

FLESH: white, often stained with red next the skin; texture peculiar, quince like, juicy; flavor subacid, slightly astringent.

QUALITY: dessert poor; cooking fair.

COMMERCIAL VALUE: second class.

SEASON: late autumn.

HARE PIPKA.

Macoun has found this identical with Lowland Raspberry.

HERREN.

A variety introduced from Poland. Stevenson finds it successful at Morden, Manitoba.

TREE: exceptionally hardy.

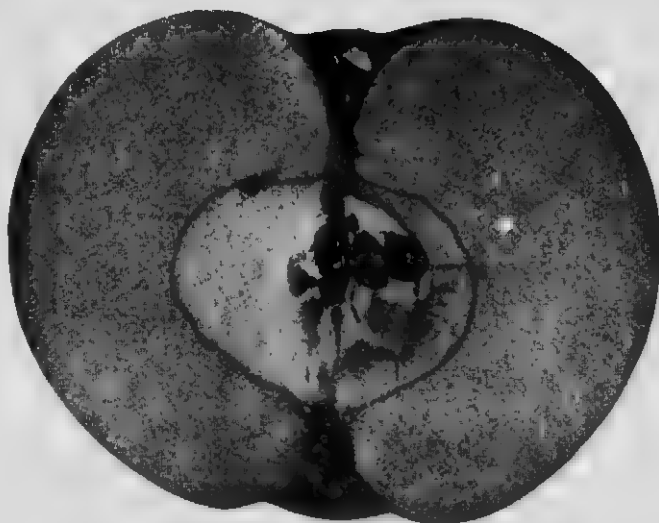
FRUIT: medium, regular, oblate; skin yellow, nearly covered with dark red, splashed crimson; basin wide; stem medium.

FLESH: white, subacid.

SEASON: early winter.



HIBERNAL.



SECTION OF HIBERNAL.

HIBERNAL.

An attractive cooking apple, valuable also for hardiness of tree; one of the best of the Russian apples for our colder districts.

TREE: strong, vigorous, healthy, productive.

FRUIT: size large; form roundish, oblate conical; skin yellowish, striped and splashed with red, with small white dots; stem medium length set in a moderately deep regular cavity with large patch of russet; calyx half open in a narrow, shallow, wrinkled cavity.

FLESH: color yellowish; texture, tender, crisp, juicy; flavor astringent acid.

QUALITY: dessert poor; cooking good.

COMMERCIAL VALUE: second class.

SEASON: September to November.

HOLLAND PIPPIN.

FRUIT: very large, roundish, somewhat oblong, and flattened at the ends, sometimes slightly oblate; greenish yellow, becoming pale yellow or whitish yellow with a brownish red cheek; stalk variable in length, usually short; cavity wide, acute; basin slightly plaited.

FLESH: nearly white, rather acid.

SEASON: mid autumn; but good for cooking early in the autumn. (Thomas.)

An excellent culinary sort; introduced into Niagara district, Ontario, about 1825; wholly distinct from Fall Pippin.

HUBBARDSTON.

(*Hubbardston's Nonsuch.*)

A first class commercial apple for early winter, and growing in favor in some localities, both of Nova Scotia and Ontario.

ORIGIN: Hubbardston, Massachusetts.

TREE: hardy, vigorous, but somewhat subject to apple canker, and therefore better top worked on some healthy grower; very productive; an early bearer.

FRUIT: medium to large; form round ovate, fairly regular; skin rich yellow ground nearly covered with stripes and splashes of light rich red; stem three-quarters of an inch long, set in a narrow deep russeted cavity; calyx open in a ribbed basin.



HUBBARDSTON.



SECTION OF HUBBARDSTON.

FLESH: texture tender and juicy; flavor subacid, rich, sweet and excellent.

QUALITY: very good.

COMMERCIAL VALUE: first class.

SEASON: October to February.

HUNT.

(*Hunt Russet.*)

ORIGIN: Massachusetts.

TREE: moderate grower, upright, spreading; a good annual bearer.

FRUIT: medium or below; roundish oblate, slightly conical; skin yellow, mostly covered with thin dull russet, with a blush of bright rich red in the sun; dots few, brown; cavity large, deep, acute; basin medium, slightly corrugated; calyx partially open; segments medium, a little reflexed.

FLESH: yellowish white, fine grained, tender, juicy, rich, brisk, subacid, slightly aromatic.

QUALITY: very good to best.

SEASON: January to April. (Hansen.)

HUNTSMAN.

ORIGIN: farm of John Huntsman, Fayette, Missouri.

TREE: vigorous, not a very early bearer; but a heavy cropper with age.

FRUIT: large, roundish oblate, obscurely angular; surface a clear yellow, with a faint bronze blush, an attractive color; dots obscure, numerous, gray, small; cavity regular wide, very deep, obtuse, green with faint trace of russet; stem short; basin abrupt, medium depth, slightly corrugated; calyx closed; . . . seeds plump, rather small.

FLESH: yellow, mild spicy, sweet subacid, very good.

SEASON: December to March. (Hansen.)

HURLBUT.

ORIGIN: farm of Gen. Hurlbut, Winchester County, Conn.

TREE: very vigorous, and a great bearer.

FRUIT: medium, oblate, slightly conic, angular. Skin yellow, shaded with red stripes, and splashed with darker red.

and thinly sprinkled with light dots. Stalk short, rather slender, inserted in a broad deep cavity, surrounded by russet. Calyx closed. Basin rather shallow.

FLESH white, crisp, tender, juicy, mild, sprightly subacid. Good to very good. Core small.

SEASON: October, December. (Downing.)

Jones (of St. Lawrence District, Ontario,) says this apple is not desirable in the St. Lawrence District of Ontario; the fruit rough and uneven. It is very little grown in Canada.

HYSLOP.

A well-known and widely cultivated variety of hybrid crab. Its dark rich red color and its late season combine to make it a valuable variety.

TREE: vigorous, spreading.

FRUIT: size medium; form roundish ovate, obscurely angular; color a dark rich red, covered with a heavy blue bloom and



HYSLOP.

SECTION OF HYSLOP.

having many obscure yellowish dots; stem about one and one-eighth of an inch in length set in an obtuse, regular cavity.

FLESH: yellowish, acid.

COMMERCIAL VALUE: second class, but very good for culinary uses and for cider.

SEASON: September, October.

JANNETING.

(Rawle's Genet.)

A variety that succeeds in some localities and fails in others; a profuse bearer, with a portion of the crop knotty or under size.

ORIGIN: Amherst County, Virginia; on farm of Caleb Rawle.

TREE: blossoms very late; growth slow; productive.

FRUIT: size medium; form roundish, approaching oblong or obtuse conical, often oblique; color pale red, distinct stripes on light yellow ground; stalk one-half inch long.

FLESH: nearly white; texture fine, crisp, juicy; flavor fine, mildly subacid, very good. (Thomas.)

SEASON: late winter and spring.

JEFFERIS.

A valuable variety for home uses or for local markets because of its high quality; but rather tender for distant shipments.

ORIGIN: Pennsylvania.

TREE: of moderate growth, roundish, spreading, productive.

FRUIT: of medium size, roundish oblate, conical, with a broad, deep and slightly russeted cavity; stalk medium, one-half inch long; basin abrupt, deep, smooth, regular; calyx medium, closed; tube conical; color yellow, striped with dark rich red.

FLESH: crisp, tender, almost melting, with a mild subacid, rich, excellent flavor.

SEASON: middle of September. (Report Michigan Fruit Station.)

JERSEY SWEET.

A valuable fall sweet variety for dessert or cooking.

ORIGIN: New Jersey.

TREE: vigorous, with a roundish head.

FRUIT: of medium size, roundish, conical, with a deep, narrow, irregular cavity; stalk one-half inch long; basin narrow abrupt, irregular, corrugated; calyx closed; color two shades of red, striped with yellowish green and with many greenish specks; core slightly open; seeds ovate, pointed.

FLESH: yellowish white coarse, crisp, tender, not very juicy, flavor sweet, rich.

SEASON: September to October. (Report Michigan Fruit Station.)

JEWEL.

Dr. Saunders' hybrid crab; *Pyrus baccata* with Yellow Transparent.

TREE: a strong grower and a good bearer, hardy.

FRUIT: size 1.4 inches across and 1.3 inches deep, nearly round, slightly elongated; calyx persistent; stem about one inch and one-quarter long; color yellowish, with a pale red cheek.

FLESH: texture moderately firm, crisp, juicy; flavor good, with very little astringency.

QUALITY: good.

SEASON: last week in August and early in September. (Saunders.)

JEWETT'S RED.

(Nodhead.)

ORIGIN: northern part of New England.

TREE: hardy.

FRUIT: medium, or rather large, roundish, slightly oblate; striped red or yellow or slightly greenish yellow ground, with conspicuous white dots; stem nearly an inch long; cavity acuminate; basin rather shallow.

FLESH: remarkably tender, fine grained; flavor mildly sub-acid, slightly aromatic.

SEASON: November to February.

JONATHAN.

A first class winter dessert apple, of the Spitzenberg type, valuable for the home garden.

ORIGIN: Woodstock, N.Y.

TREE: of moderate vigor; shoots slender, drooping; should be top worked on a vigorous trunk; inclined to be self-sterile, and needs to have other varieties near for perfect pollination.

FRUIT: size medium, in some localities small; form longish, truncated conical, regular; skin dark brilliant red in sun, and

striped and splashed with lighter red; dots numerous, small, whitish; stem long, slender, set in a deep acute cavity; calyx small, closed, in a wide, deep, abrupt basin.

FLESH: white; texture tender and juicy; flavor subacid, spicy, aromatic, excellent.

QUALITY: dessert best; cooking good.

COMMERCIAL VALUE: for special markets when well grown, first class.

SEASON: November to February.

KELSO.

A handsome apple; much like Scott Winter in character of flesh.

ORIGIN: Central Experimental Farm, Ottawa; McMahon female cross-bred with Scott Winter male.

FRUIT: medium in size; oblate; cavity deep, medium width, russeted; stem medium length to short, moderately stout; basin open, deep, slightly wrinkled; calyx open; pale yellow, well washed with bright crimson; dots obscure; skin moderately thick, tough.

FLESH: dull white, tender, moderately juicy; core small, closed; acid, pleasant flavor.

QUALITY: above medium.

SEASON: early to midwinter and perhaps later. (C. E. F. Report.)

KESWICK CODLIN.

A noted English cooking apple which may be gathered for tarts and pies as early as the month of August and continues in use till November. It is an early and a great bearer and a vigorous tree, and is one of the most profitable of orchard sorts for cooking or market.

TREE: very hardy, forming a large regular, spreading, round head.

FRUIT: a little above the middle size, rather conical, with a few obscure ribs. Stalk short and deeply set. Calyx rather large. Skin greenish yellow, washed with a faint blush on one side.

FLESH: yellowish white, juicy, with a pleasant acid flavor. (Downing.)

No doubt when Chas. Downing wrote the preceding, about the middle of the nineteenth century, it was correct to call this variety profitable, but we in Ontario have long ago ceased to plant this apple for profit. We have found it a prodigious bearer and an excellent pie apple but somewhat irregular in size and with too little color to make it attractive as a market variety.

KING.

(*King of Tompkins County.*)

One of the highest priced Canadian apples that is shipped into the markets of Great Britain. Unfortunately it is not very productive, and for that reason it is sparingly planted in Canadian orchards. Caston (Simcoe County, Ontario,) reports that it is improved in productiveness when top grafted on Tolman Sweet.

ORIGIN: eastern United States.

TREE: vigorous, spreading, moderately productive.

FRUIT: large, roundish, sometimes uneven; skin yellowish, shading from red to dark crimson; stem short and stout, inserted in a wide, deep, somewhat irregular cavity; calyx closed, in a broad, shallow, slightly corrugated basin.

FLESH: yellowish white, crisp and juicy, moderately firm; flavor rich, agreeable, aromatic.

QUALITY: dessert and cooking very good.

COMMERCIAL VALUE: first class, well adapted for packing in bushel boxes as a fancy apple and commanding the top price in the markets.

SEASON: October to February.

KLUVESKE.

Stevenson reports this variety as an extra hardy, round topped tree, which first fruited in Manitoba in 1900.

FRUIT: medium, roundish, bluish on sunny side.

QUALITY: fair.

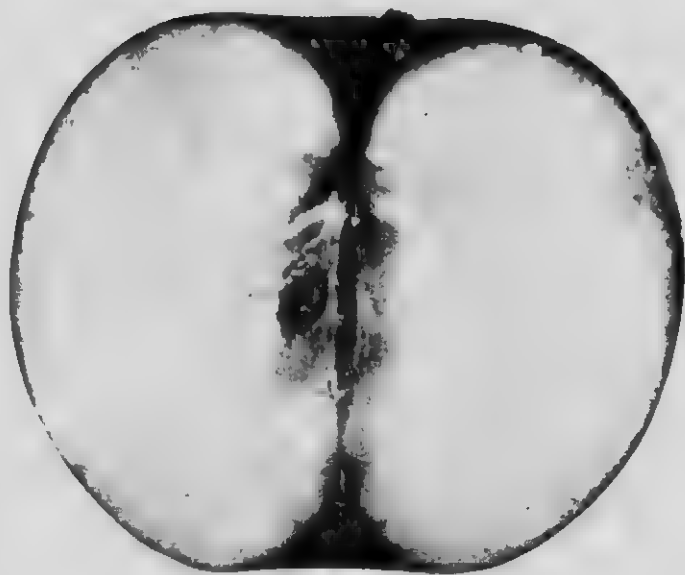
SEASON: September.

LADY.

A beautiful little apple for the amateur's collection, and very highly valued in some parts as a dessert apple, having a pleasant



KING.



SECTION OF KING.

flavor and great beauty. In Europe the apple has been called Api, but in Canada the Lady apple, some say because in size and beauty it seems just suited to a lady's mouth.

ORIGIN: France.

TREE: habit upright; bears fruit in clusters; vigorous; not very hardy; productive rather with respect to number of apples than of bushels.



SECTION OF LADY

FRUIT: very small, flat oblate; color green, turning to yellow, half covered with a rich red cheek and many tiny dots, which are more numerous toward the apex; stem slender, half an inch long, set in a deep regular cavity; calyx closed in a small wrinkled basin.

FLESH: greenish white; texture fine grained, crisp and juicy; flavor pleasant.

QUALITY: dessert best; cooking too small to be of any value.

COMMERCIAL VALUE: third class, except for some particular markets.

SEASON: December to May.

LANE'S PRINCE ALBERT.

According to Hogg's Fruit Manual, from which the following description is taken, this excellent cooking apple was raised by Mr. Lane, of Birkhamstead, England, and first exhibited in 1857.

TREE: a marvellous bearer, cropping annually.

FRUIT: large, handsome three and a quarter by three and a half inches; conical or ovate, even and regular in outline, with broad, obtuse ribs round the crown; skin smooth and shining.

bright grass green at first but changing to clear pale yellow as it ripens; where exposed to the sun it is pale red marked with broken streaks of bright crimson; eye rather small, closed, . . . set in a deep saucer-like plaited basin.

FLESH: tender, juicy, briskly and agreeably flavored.

SEASON (in England): October to March.

LANGFORD BEAUTY.

(*Russell.*)

ORIGINATED in Russell County, Ontario.

TREE: vigorous; hardy.

FRUIT: medium to above medium in size, roundish to oblate; skin pale yellow, almost completely covered with deep red; dots few, gray, not prominent; cavity shallow, open; stem long slender; basin shallow, open, slightly wrinkled; calyx closed.

FLESH: white, tender, melting, juicy, subacid, with a pleasant flavor, having a suggestion of Fameuse about it, slightly astringent; core large.

QUALITY: good.

SEASON: middle of August to middle of September.

Fruit ripens unevenly, making it more desirable for home use than for commercial purposes. (Macoun.)

LA VICTOIRE.

This variety has not, so far, proved very productive, but is a handsome apple, and on account of its season and hardiness will probably prove useful in the north. (Macoun.)

ORIGINATED near Grenville, Que. Probably a seedling of Fameuse.

TREE: hardy and a strong, moderately spreading grower.

FRUIT: above medium size, oblate, regular; skin greenish yellow, almost covered with crimson; dots fairly numerous, gray, distinct; cavity of medium depth and width, slightly russeted; stem short and stout; basin of medium depth and width, almost smooth; calyx open and medium in size.

FLESH: white, tinged with red, rather coarse, moderately juicy, mildly subacid, with a pleasant flavor; core small.

QUALITY: good.

SEASON: midwinter.

LAWVER.

(Delaware Red Winter.)

An exceptionally good keeping apple; may be kept a year in an ordinary cellar.

TREE: hardy, vigorous, moderately upright; an annual but not a heavy bearer.

FRUIT: above medium size, roundish to oblate, somewhat angular; skin yellow, nearly all, or quite, covered with bright to deep red; dots few, pale, distinct; cavity medium in depth, narrow; stem long and slender; basin very shallow, narrow, wrinkled; calyx small and closed.

FLESH: yellow, faintly tinged with pink, firm, crisp, tender, juicy, sprightly subacid, slightly aromatic; core small.

QUALITY: above medium.

SEASON: late winter. (Report C. E. F., Ottawa.)

LEMON PIPPIN.

A very good apple, either for culinary use or for dessert; it is in season from October to April, and is perhaps the most characteristic apple we have (in England), being sometimes so much like a lemon as at first sight to be taken for that fruit. The tree does not attain a large size, but is healthy, hardy and a good bearer.

FRUIT: medium sized, three and a quarter inches long by two and a half broad; oval with a large fleshy elongation covering the stalk, which gives it the form of a lemon; skin pale yellow, tinged with green, changing to lemon yellow as it attains maturity, strewed with russety freckles and patches of thin delicate russet; calyx small and partially open, with short segments and set in an irregular basin, which is frequently higher on one side than the other. . . . Stalk short, entirely covered with the fleshy elongation of the fruit.

FLESH: firm, crisp and briskly flavored; core very small and occupying very little space in the fruit. (Hogg.)

This apple, like some other English varieties, seems to succeed better in British Columbia than in Ontario

LINTON.

Resembles Winter St. Lawrence somewhat in outward appearance, but flesh is whiter and tenderer.

ORIGIN: Central Experimental Farm, Ottawa. from seed of Winter St. Lawrence.

FRUIT: medium size; roundish, regular; cavity medium depth and width; stem medium length, slender; basin medium depth and width, wrinkled; calyx closed; pale yellow thinly splashed with bright red; dots obscure; skin moderately thick, tender.

FLESH: white tender, juicy; core medium; mildly subacid, pleasant flavor.

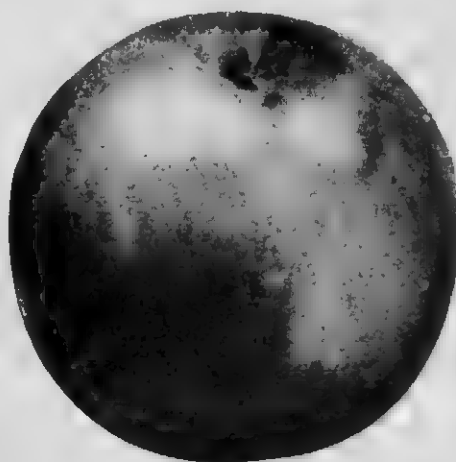
QUALITY: good.

SEASON: early to mid-September. (C. E. F. Report.)

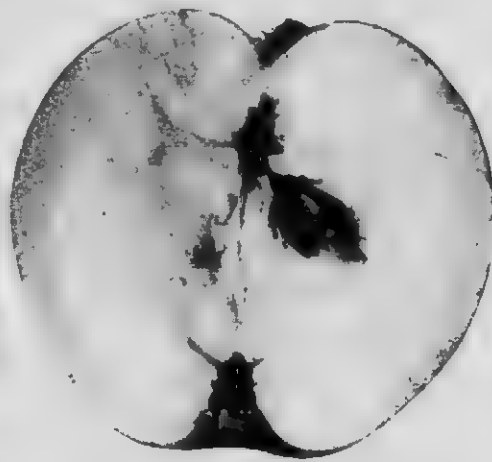
LONGFIELD.

A late fall variety, valued for its hardiness; too small to be profitable where better kinds succeed.

ORIGIN: Russia.



LONGFIELD.



SECTION OF LONGFIELD.

TREE: a poor straggling grower; very hardy; very productive; inclined to overbear and requires thinning; an early bearer.

FRUIT: size small; form roundish conical; skin yellow with bright red cheek; dots few, large, yellowish; smooth: tender.

showing bruises easily; stem short, set in a deep regular cavity; calyx half open, in an abrupt, wrinkled basin.

FLESH: very white; texture very tender, juicy; flavor pleasant, subacid.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: third class.

SEASON: October and November.

LORD SUDELY.

Reported favorably for planting in British Columbia, by Thos. Sharpe, of Agassiz, who describes it as follows in his last report:

TREE: a healthy, free grower and productive.

FRUIT: of medium size, bright yellow, striped and splashed with bright red.

FLESH: white, crisp, juicy, very pleasant, with a sprightly flavor.

SEASON (British Columbia): August.

LORD SUFFIELD.

This apple, like several others from England, seems to succeed well in British Columbia; therefore we include the following description by Thos. Hogg, which was written from an English standpoint:

One of the best early cooking apples.

ORIGIN: near Manchester; introduced 1837; named after Lord Suffield.

TREE: an early and very prolific bearer, and one of those varieties which, on account of these properties, is not long lived.

FRUIT: large, two and three-quarter inches wide by three inches high; form conical or ovate, even in its outline, with several obtuse angles on its sides; skin smooth, pale greenish yellow, with sometimes a tinge of red next the sun; calyx small and quite closed, segments connivent and placed in a plaited basin; . . . stem slender, over one-half inch long, inserted in a deep cavity.

FLESH: white, tender and firm, very juicy and briskly flavored.

SEASON: August and September.

LOUISE.

(Princess Louise, Woolverton.)

A choice dessert apple for the home garden, but not productive enough for profit.

ORIGIN: a chance seedling of the Snow on the farm of Linus Woolverton, Grimsby, Ontario, and named Princess Louise after Her Royal Highness, wife of the Marquis of Lorne, then Governor-General of Canada.

TREE: of slender habit; fairly vigorous; hardy; moderately productive.

FRUIT: medium size; roundish; skin greenish yellow of bright waxy lustre with cheek of clear bright carmine; stem stout, three-quarters inch long in a narrow, moderately deep cavity; calyx half open in a broad, shallow, slightly plaited basin.

FLESH: pure white; texture tender, fine, somewhat crisp, juicy with rich aromatic flavor.

QUALITY: dessert best; cooking fair.

COMMERCIAL VALUE: first class as a fancy fruit.

SEASON: November to February.

LOWLAND RASPBERRY.

(Liceland Raspberry, Hare Pipka.)

A handsome hardy summer apple of very good dessert quality. One of the best summer apples for home use, but drops rather badly and ripens unevenly.

ORIGIN: Russia.

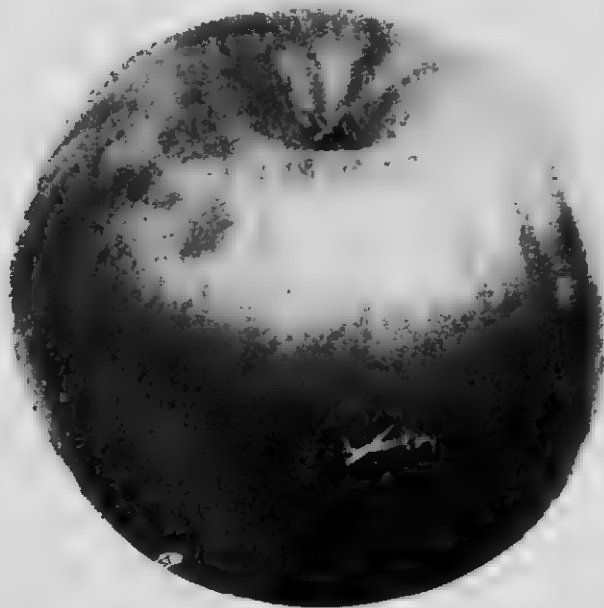
TREE: moderately upright, vigorous, moderately productive.

FRUIT: medium to large, roundish to oblate conical, angular; color pale yellow, more or less marked, splashed and washed with bright red with a few pale yellow indistinct dots; stem short to medium, moderately stout in a narrow cavity of medium depth; basin shallow, narrow, slightly wrinkled.

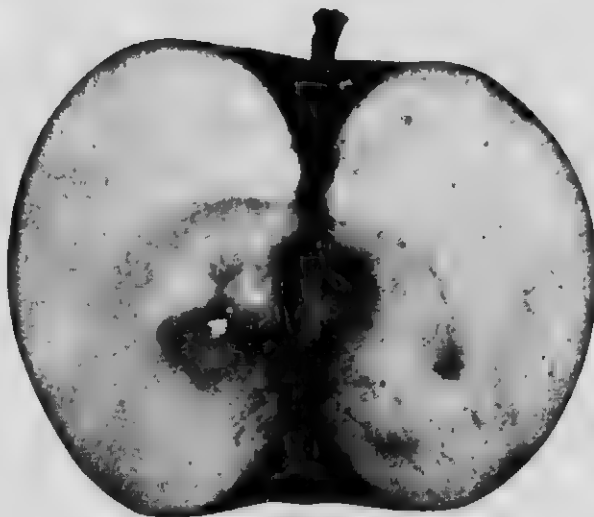
FLESH: white tinged with red, crisp, tender, juicy, subacid with a good flavor.

QUALITY: dessert very good.

SEASON: middle to last of August. (Macoun.)



LOUISE.



SECTION OF LOUISE.

LUBSK QUEEN.

A very handsome apple not unlike Red Astracan in appearance, but skin more waxy; also somewhat resembling Lowland Raspberry. It is handsomer than either Lowland Raspberry or Red Astracan, but not so good in quality. It should ship better.

ORIGIN: Russia; introduced into America in 1870. Planted at Central Experimental Farm, Ottawa, in 1892.

TREE: hardy; habit moderately vigorous and upright; a medium to good bearer.

FRUIT: above medium size; roundish, somewhat angular, flattened a little at ends; cavity shallow, medium width, russeted; stem short to medium, stout; basin open, medium depth, wrinkled; calyx open or partly open; pale yellow, almost white, waxy, well washed with bright, lively red; dots moderately numerous, yellow, indistinct; bloom bluish, noticeable; skin with smooth surface, moderately thick, tender.

FLESH: white, tinged with red near skin, firm, juicy; core medium; subacid, pleasant flavor.

QUALITY: above medium.

SEASON: late August to early September. (Macoun.)

McINTOSH.

(*McIntosh Red.*)

A very fine dessert apple for early winter use. At Ottawa and along the St. Lawrence and other places where conditions are favorable, it is counted one of the best dessert apples of its season; but in the warmer sections it is inclined to drop early, and is somewhat subject to scab.

ORIGIN: with John McIntosh, Dundela, Ont., in whose orchard the original tree was still standing in 1904.

TREE: hardy, vigorous; moderately productive; an annual bearer; of Fameuse type.

FRUIT: medium to large; form roundish; color deep crimson in sun, light crimson on shady side, inclined to show broken stripes and yellow dots; often with a heavy blue bloom; stem one inch in length, stout, set in a wide and often irregular cavity which is green at bottom; calyx closed, in a smooth, regular, rather shallow basin.

FLESH: color snow white; texture crisp, tender, very juicy; flavor slightly subacid, aromatic, perfumed near the skin.

QUALITY: dessert first class.

COMMERCIAL VALUE: first class in the colder sections.

SEASON: November to January.

McMAHON.

(McMahon White.)

A good sized and rather attractive fall apple, valuable especially for the hardness of the tree; succeeds well in the colder sections; too tender in flesh to be a good shipper.

ORIGIN: from seed of Alexander, planted about 1860 by A. L. Hatch, Ithaca, Wisconsin.

TREE: very hardy; very strong grower; productive.

FRUIT: size large, uniform; form roundish oblate, slightly conical, obscurely ribbed; skin light yellow, becoming white at fall maturity, often with a blush of red and large white dots; stem short, one-half inch long, stout, in an acute deep, russeted cavity; calyx half open, in a narrow, moderately deep, slightly wrinkled basin.

FLESH: white; texture coarse grained, tender, juicy; flavor subacid.

QUALITY: dessert fair; cooking very good.

PROBABLE COMMERCIAL VALUE: first class in cold sections for near markets; third class for export.

SEASON: October to December.

MAGNUS.

Dr. Saunders' hybrid crab, one of the largest and best; recommended for Manitoba and Saskatchewan; *Pyrus prunifolia* with Simbirsk No. 9. Described in Report C. E. F. as follows:

TREE: a strong grower and a fair bearer.

FRUIT: size 1.8 inches across and 1.7 inches deep; nearly round; calyx persistent; stem about one-half inch long; color orange and scarlet.

FLESH: firm, rather juicy but not crisp; flavor subacid; aromatic, very slight astringent.

QUALITY: cooking very good.

SEASON: September 20 to 30.

MAGOG.

A Vermont apple which was planted in the colder sections on account of its hardiness; but cannot be recommended for profit. Jones has fruited it in the St. Lawrence district of Ontario; the fruit was large, yellow, faintly streaked, but drops badly.

ORIGIN: by Wm. Warren, Newport, Vt.

TREE: moderately vigorous; hardy; productive.

FRUIT: medium to large, uniform, variable; form roundish, conical, sometimes ribbed, unequal; stem short; cavity acute, medium depth; calyx small, closed; basin medium coarsely wrinkled; skin greenish to yellow, washed with faint brownish red, striped and splashed with deeper red; dots many, brown and russet.

FLESH: yellowish; texture firm, fine grained, tender, juicy; flavor sprightly subacid, pleasant.

QUALITY: good.

COMMERCIAL VALUE: third class.

SEASON: October to January.

MAIDEN BLUSH.

A valuable apple for the amateur because of its extreme beauty; but not considered a profitable market apple; tested many years in Niagara district, Ontario.

ORIGIN: New Jersey.

TREE: moderately vigorous; fairly productive; drops its fruit early.

FRUIT: size medium to large; form oblate, very regular, but slightly one-sided; color lemon yellow with beautiful crimson blush; stem three-quarters inch long set in a moderately deep, wide cavity; calyx closed, in a shallow, slightly wrinkled basin.

FLESH: white; texture fine, tender; flavor pleasant, subacid.

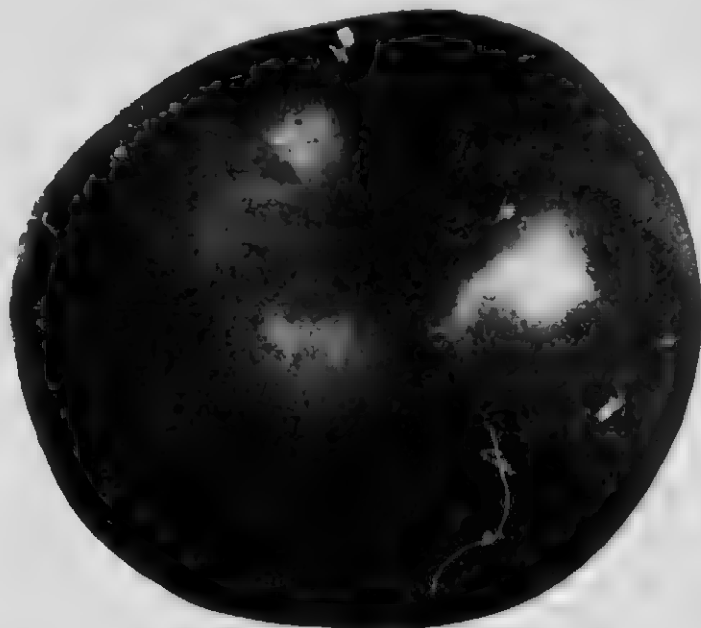
QUALITY: dessert fair; cooking good.

SEASON: September and October.

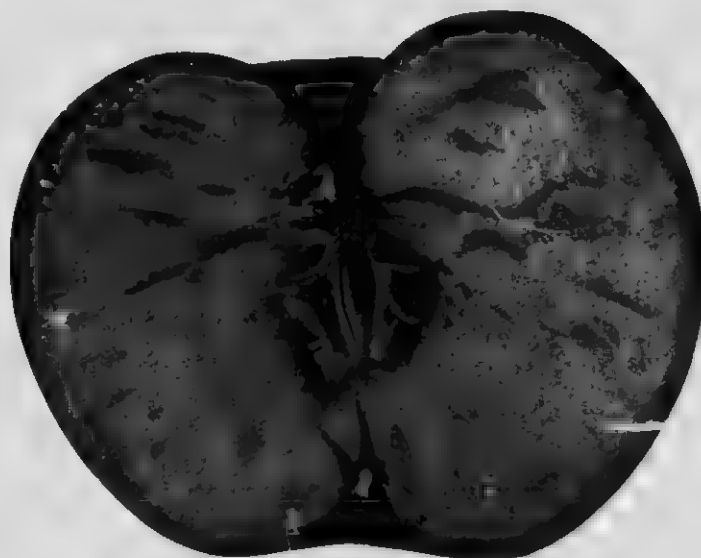
MALINDA.

ORIGINATED by Mr. Rollins, Orange Co., Vt., and named for one of his daughters.

TREE: a slender, straggling grower in nursery and tardy bearer; has done well in northern Iowa.



MAIDEN BLUSH.



SECTION OF MAIDEN BLUSH.

FRUIT: above medium to large, sharply conical, somewhat angular and ribbed; surface smooth rich yellow with dull red blush; dots minute, white, distinct, numerous; cavity acute, medium, regular, with stellate russet patch; stem short, stout; basin narrow, abrupt, wavy, corrugated, deep; calyx closed, meeting.

FLESH: yellowish white, firm, juicy, very mild subacid, with sweet after-taste, fair.

SEASON: late winter. (Hansen.)

MANN.

For productiveness and long keeping the Mann apple has a high reputation and is being planted quite freely in some of the commercial orchards of Ontario; but the unattractive green color of the skin is a serious drawback to its commercial value.

ORIGIN: New York State: a chance seedling raised by Dr. Mann.

TREE: hardy, vigorous, spreading with slender branches; productive, inclined to overload and needs thinning; an early and regular bearer; inclined to drop its fruit a little early; inclined to sun scald in cold sections.

FRUIT: of large size when thinned and well cultivated; form roundish, oblate, regular; skin dull green, yellowing at maturity, nearly covered with light green dots; stalk one-half inch long in a large, slightly russeted cavity; calyx closed in a large plaited basin.

FLESH: yellowish, moderately firm, juicy, agreeable, subacid.

QUALITY: dessert poor; cooking good.

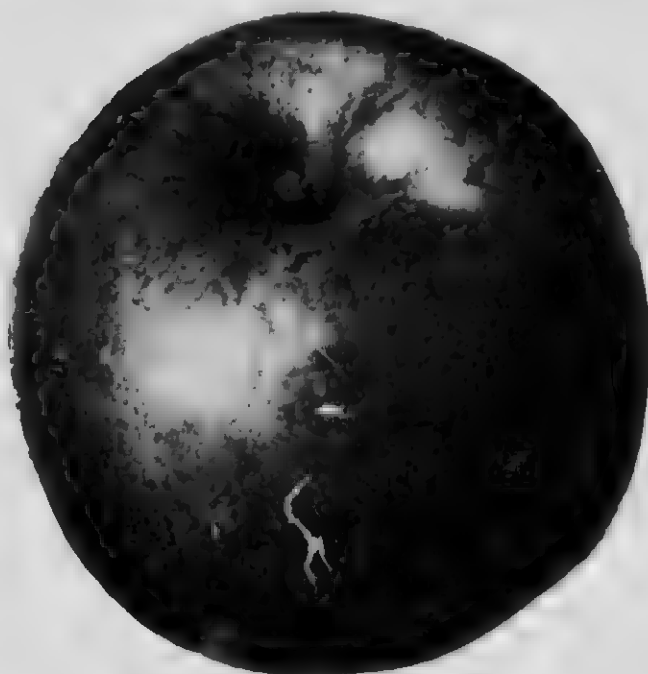
COMMERCIAL VALUE: first class, as No. 1 stock but not fancy; not as much in demand as colored varieties.

SEASON: January to April.

MARTHA.

A hybrid crab which has fruited in Manitoba. Seedlings of Martha were raised at the Brandon Experimental Farm, but Dr. Saunders writes that a large number of them perished with blight.

ORIGIN: by Peter M. Gideon, Excelsior, Minn.



MANN.



SECTION OF MANN.

FRUIT: large, oblate, very regular; surface smooth, yellow, almost entirely covered with a beautiful bright red, with a bluish bloom, no stripes or splashes; dots white, conspicuous; cavity



SECTION OF MARTHA.

MARTHA.

wide, regular; stem long; basin very wide, nearly flat; segments often nearly obsolete; core closed.

FLESH: yellowish white, acid; good for culinary use.

SEASON: early to mid September.

MEDFORD.

A promising apple, much like Wealthy in general appearance, though flatter, and probably a month earlier.

ORIGIN: Central Experimental Farm, Ottawa, from seed of Wealthy.

FRUIT: medium size; oblate; cavity open, medium depth; stem short, moderately stout; basin open, deep, wrinkled; calyx closed; pale yellow, well splashed and washed with crimson; dots few, white, indistinct; skin moderately thick, moderately tough.

FLESH: white tinged with red, crisp, tender, rather breaking, juicy; core small; flavor subacid, sprightly, pleasant, much like that of Wealthy.

QUALITY: good.

SEASON: early September. (C. E. F. Report.)

MILWAUKEE.

One of the best hardy winter apples for the commercial orchards in the northern belt of apple culture; a fairly good shipping apple.

ORIGIN: a seedling of Duchess, by Geo. Jeffrey, Milwaukee, Wisconsin.

TREE: growth moderately vigorous; habit spreading; very hardy, very productive; an early bearer; foliage dark green, abundant; shows characteristics of the Duchess.

FRUIT: large, oblate, flattened, slightly angular; skin yellowish green, blushed and streaked with bright red and crimson on the sunny side; stem slender, one-half inch long in a large, deep, often russeted, cavity; calyx half closed in a wide deep wrinkled basin.

FLESH: color yellowish white; texture tender, crisp, juicy; flavor acid.

QUALITY: dessert fair; cooking very good to best

PROBABLE COMMERCIAL VALUE: first class.

SEASON: December to March.

MONMOUTH PIPPIN.

(See *Red Checked Pippin*.)

MONTREAL.

(*Montreal Beauty Crab*.)

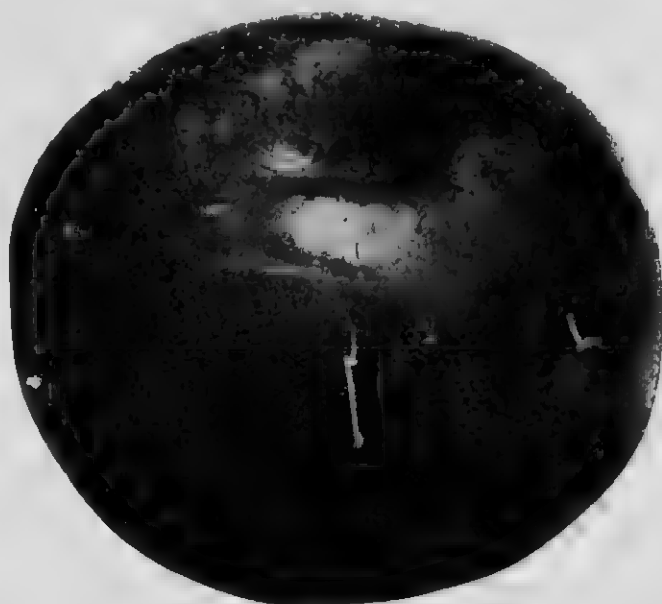
This very beautiful fruit originated in the Province of Quebec, and was propagated as early as 1833. Gibb states the tree is less hardy than that of Transcendent, but is strong, vigorous, rather large, at first very close and upright; does not come into bearing early, but bears heavily.

FRUIT: is large for its class, oblong conic to roundish oblong and truncate, yellowish green mostly covered with red.

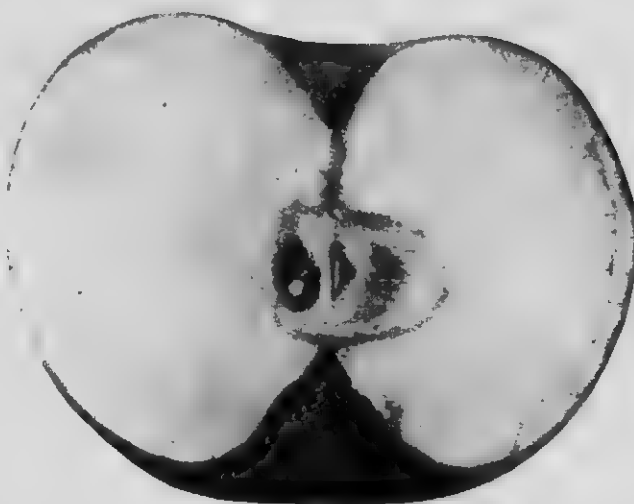
FLESH: yellowish white, tender, rather juicy unless over-ripe, subacid, very slightly astringent.

SEASON: late September and October.

It is well known in the vicinity of Montreal and other portions of Quebec. (Beach.)



MILWAUK



SECTION OF MILWAUK.

NEWTOWN PIPPIN.*

(*Green Newtown Pippin, Yellow Newtown Pippin, Albermarle.*)

The highest priced apple that reaches the British market, but not much grown in Canada because the fruit is subject to apple scab; fine samples have been sent us from Norfolk Co.

ORIGIN: Newtown, Long Island.

TREE: a slow grower and only moderately hardy; needs rich soil and good cultivation; productive.

FRUIT: medium to large; form roundish oblique, with broad obscure ribs terminating in five crowns at the apex; color dull green becoming yellowish during winter with reddish brown tinge on the sunny side and dotted with small gray russety dots; stalk half an inch long, inserted all its length in a deep, wide, funnel-shaped cavity; calyx small, closed, in a small, moderately deep basin.

FLESH: greenish white to yellow; texture firm, crisp, juicy; flavor rich and highly aromatic.

QUALITY: dessert first class; cooking first class.

COMMERCIAL VALUE: first class, if grown free of blemishes.

SEASON: January to May.

NONPAREIL.

In England one of the most highly esteemed and popular of English dessert apples; not valued in Canada, though reported favorably from some parts of Nova Scotia; resembles the Roxbury.

ORIGIN: France; probably brought to England about the time of Queen Elizabeth. Dr. Hogg describes it as follows:

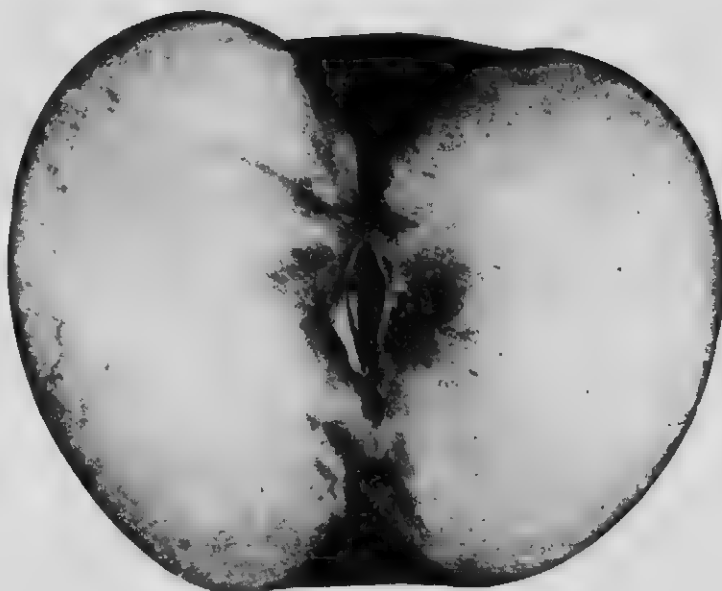
TREE: a free grower, healthy, scarcely attaining medium size, an excellent bearer.

FRUIT: below medium, two inches (long) by two and a half inches (across), roundish, broad at base and narrowing toward the apex; skin yellowish green, covered with large patches of thin gray russet, and dotted with small brown, russety dots with occasionally a tinge of dull red on the side next the sun; eye rather prominent, very slightly, if at all, depressed, half open; stalk an inch long, set in a round and pretty deep cavity which is lined with russet.

* Some claim that the Yellow is a distinct variety, yellower in flesh and skin; others that it differs only from warmer exposure.



NEWTOWN PIPPIN.



SECTION OF NEWTOWN PIPPIN.

FLESH: greenish, delicate, crisp, rich and juicy, abounding in a particularly rich, vinous and aromatic flavor.

SEASON (of use in England): January to May. Thomas says that in New York State its season is December.

NORTH STAR.

(Dudley Winter.)

ORIGINATED in Maine.

TREE: vigorous and productive. A handsome apple about the same season as Wealthy; succeeds well in some of the colder parts.

FRUIT: roundish; size above medium to large; cavity open, deep, slightly russeted; stem medium length, slender; basin deep, medium width, slightly wrinkled; calyx partly open; color pale yellow, streaked and splashed with deep, lively red; dots few, small, pale yellow, indistinct; skin moderately thick, tender.

FLESH: yellow, rather coarse, tender, moderately juicy; core small; flavor pleasant, subacid; quality above medium, almost good.

SEASON: late September to early winter. (Macoun.)

NORTHWESTERN GREENING.

One of the best winter commercial apples, especially for colder sections; attractive in appearance.

ORIGIN: Wisconsin, 1877

TREE: hardy, about equal to Wealthy in this respect; productive, but rather slow in coming into bearing; recommended for sections where the Greening is too tender.

FRUIT: large to very large; form roundish, slightly conical; color green, becoming yellowish, with small white dots; stem about one-half inch long in a regular funnel shaped cavity of moderate depth; calyx closed, in a regular, very slightly wrinkled basin.

FLESH: greenish white; texture fine grained, firm and juicy; flavor sprightly subacid, pleasant.

QUALITY: dessert good; cooking fair.

COMMERCIAL VALUE: first to second class; not a very good shipper.

SEASON: winter.

OKABENA.

ORIGINATED on banks of Lake Okabena in southwestern Minnesota, from seed of Duchess fertilized by Wealthy, furnished by Peter Gideon in 1871, described by Hansen as follows:

FRUIT: large, regular, oblate; skin greenish yellow, striped and splashed with red, sometimes covering the entire surface, on sunny side mixed and marbled with dark crimson stripes and splashes; dots minute, scattered, white, obscure; cavity regular, deep, sometimes russeted; stem variable; basin wide, rather shallow, regular, sometimes abrupt; calyx closed.

FLESH: white, sometimes stained; texture fine grained, juicy; flavor subacid, very good.

SEASON: December.

ONTARIO.

A favorite commercial apple on account of early and abundant bearing, and the uniform size and good quality of the fruit.

ORIGIN: Paris, Ontario, by Charles Arnold, a cross between Wagener and Spy.

TREE: fairly hardy; moderately vigorous; spreading; very productive; begins to bear at an early age, but inclined to exhaust itself by over cropping.

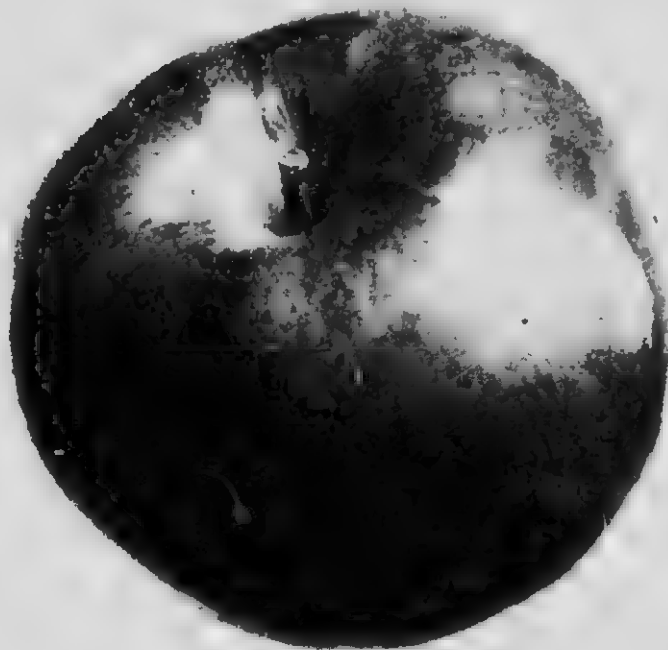
FRUIT: large, oblate, slightly ribbed, sides unequal; skin yellowish, nearly covered with bright red, and bluish bloom; dots few, scattered, small, white; stem seven-eighths of an inch long, in a deep, russeted, uneven cavity; calyx closed, in a moderately deep corrugated basin.

FLESH: white with green tint, yellowing slightly as it ripens; texture fine grained, tender, juicy; flavor mild subacid, slightly, aromatic.

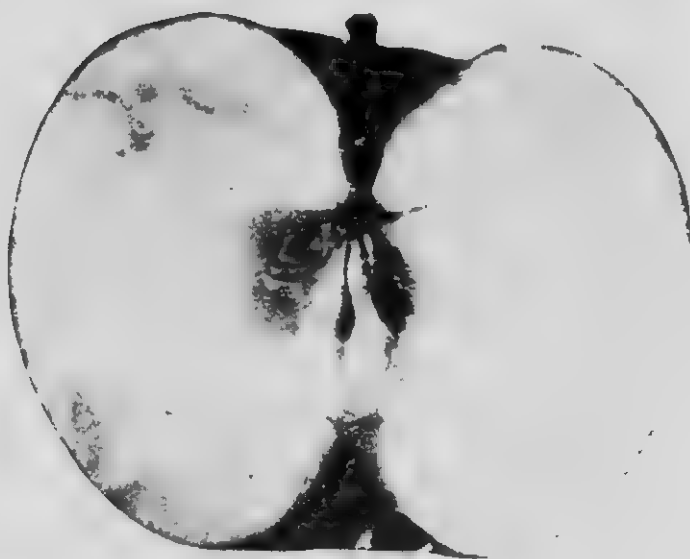
QUALITY: very good for all purposes

COMMERCIAL VALUE: first class.

SEASON: November to April



ONTARIO.



SECTION OF ONTARIO

ORANGE.

A fairly good dessert variety of hybrid crab.

ORIGIN: United States.

TREE: slow grower, productive.

FRUIT: size medium; form round, slightly flattened at the ends; color light orange, with minute dots and russet veins; stem slender, an inch and a quarter in length, set in a deep, open cavity; calyx closed in a furrowed basin.

FLESH: color yellowish, yellow veinings; texture a little dry; flavor mild, pleasant acid.

SEASON: September.

OSCAR.

This is a very handsome apple and should sell well. It is one of the earliest bearers in the Russian seedling plantation. It should be a useful seedling even in the Ottawa district, as it comes in before Wealthy. It is firm and should ship well.

ORIGIN: Central Experimental Farm, Ottawa, from seed of Russian apple, described by Macoun as follows:

FRUIT: above medium size; conical, almost oblong; cavity narrow, medium depth, russeted near base; stem medium length, moderately stout; basin shallow to medium, medium width, wrinkled; calyx closed; pale yellow well washed and splashed with bright crimson, attractive; dots moderately numerous, gray, indistinct; bloom thin, pinkish; skin moderately thick, moderately tough.

FLESH: white with traces of red, tender, juicy; core above medium size; briskly subacid, little flavor.

QUALITY: above medium.

SEASON: early October.

OSTROKOFF.

Stevenson recommends this apple as being valuable in Manitoba. Thomas describes it as follows:

ORIGIN: Russia.

TREE: very hardy.

FRUIT: medium, round; yellow; cavity deep; stem medium; basin shallow, ribbed.

FLESH: greenish, acid.

VALUE: good for cooking.

SEASON: early winter.

PATTEN.

A seedling of Duchess, raised by C. G. Patten, of Iowa; placed in the list of varieties of the first degree of hardiness by the Minnesota Horticultural Society. It is described by Hansen, in "Systematic Pomology," as follows:

FRUIT: large, roundish oblate, irregular, obscurely angular; surface yellowish green, with bronze blush; dots minute, white; cavity regular, acute, russeted; stem short to very short; basin broad, slightly wavy, abrupt; calyx open.

FLESH: white, juicy, sprightly subacid, good for table, excellent for cooking.

SEASON: October to January.

PEACH.

(*Montreal Peach, Pomme Pêche.*)

Considered a valuable early fall apple for local markets in the Province of Quebec, but too easily bruised for shipment, and a poor keeper.

ORIGIN: an old variety, probably introduced from France by early French colonists.

TREE: hardy, thrifty and very productive.

FRUIT described by U. S. Div. of Pom. as follows: large, roundish oblong; skin thin and tenacious; surface smooth, glossy white, lightly washed with dull red, indistinctly striped crimson, without bloom; dots yellow or brown; cavity regular, medium russet circles; stem long slender; basin regular, medium, abrupt, furrowed; calyx medium, nearly closed; segments long, narrow, slightly reflexed; core wide, conical, clasping, large; seeds large, short, brown, ten in number; flesh yellowish white, fine grained, tender, juicy, brisk, slightly subacid, good; early autumn.

COMMERCIAL VALUE: third class.

SEASON: September.

PEERLESS.

A remarkably attractive fall market or shipping apple; grows bright and clean, like Duchess, without blemishes; growing in favor: Caston grows this apple to perfection near Lake Simcoe, Ontario.

ORIGIN: seedling of Duchess; Minnesota, 1865.

FRUIT described by Hansen as follows: large, roundish oblate, regular; surface greenish, striped and splashed rather thinly with dull red, slightly marbled on sunny side; cavity wide with radiating green (a characteristic); stem short; basin wide, usually abrupt and wavy; calyx closed or half open.

FLESH: firm, juicy, subacid, good

QUALITY: cooking first class.

COMMERCIAL VALUE: first class.

SEASON: September to November.

PERFECTION.

A summer apple recommended by the United States Division of Pomology. The Illinois Horticultural Society Report, 1897, speaks of it thus: A Wisconsin seedling of Tetofsky.

TREE: perfectly hardy and symmetrical.

FRUIT: as large again as Tetofsky and of better quality.

SEASON: August and September.

PETER.

Cannot be distinguished from Wealthy.

PEWAUKEE.

A good commercial apple for the northern limits of apple growing where Spy and Baldwin are tender; but not as hardy as first supposed; not gaining in popularity.

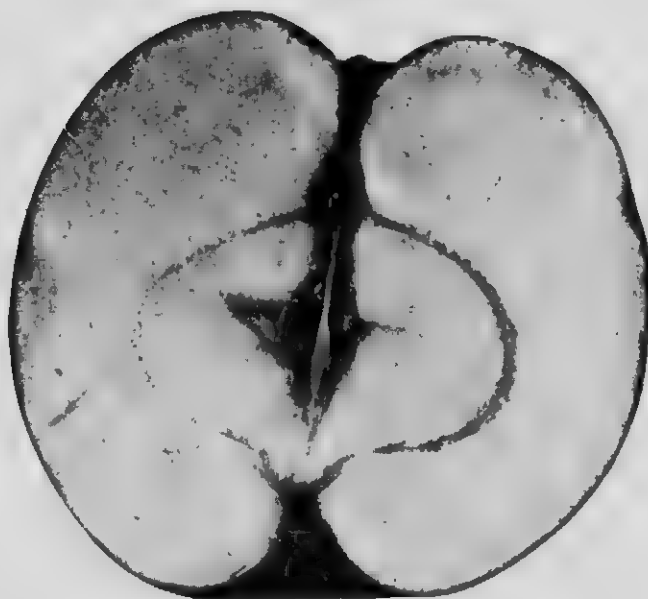
ORIGIN: seed of Oldenberg crossed with Spy; raised by G. P. Pepper, Pewaukee, Wisconsin, about 1870.

TREE: hardy, but not equal in this respect to Wealthy; vigorous; habit round top, upright centre; an annual bearer.

FRUIT: size large; form roundish oblate, irregular, unequal; color yellow, striped and splashed with red; dots whitish; bloom grayish; stem short, one-half inch, sometimes fleshy at point of insertion, set in a small shallow, often flat cavity, sometimes lipped; calyx half open, large, in a small shallow, corrugated basin.



POMERANIAN.



SECTION OF POMERANIAN

FLESH: color yellowish; white with yellow veinings; texture firm, rather coarse, juicy; flavor fair, subacid.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: first class (when well colored) to second class.

SEASON: December to March.

POMME GRISE.

(Probably the Reinette Grise of Le Roy.)

Valued only for dessert purposes; succeeds especially well in the St. Lawrence Valley of Ontario.

ORIGIN: long in cultivation among the French in the St. Lawrence Valley; possibly the old Reinette Grise of Europe.

TREE: hardy, healthy, productive, holds its fruit well.

FRUIT described by Hansen, "Systematic Pomology," as follows: small; form roundish oblate, regular; surface rough, with thick scaly russet, greenish gray in shade and a deep orange red cheek on sunny side; cavity small, shallow, wide; stem short slender; basin narrow, shallow; calyx small open.

FLESH: yellowish; texture crisp, tender, very juicy, very rich, brisk, highly aromatic.

QUALITY: dessert first class; cooking third class.

COMMERCIAL VALUE: third class.

SEASON: October to January; in cold storage till March.

PORTER.

An old variety once in good demand in local markets as a September dessert apple, and still desirable for planting in the home garden; too tender for shipping.

ORIGIN: Massachusetts, 1800, by Rev. Samuel Porter.

TREE: vigorous, compact, hardy, an early biennial cropper, productive.

FRUIT: medium; form regular, oblong, tapering to calyx; surface glossy bright yellow, with a few dull stripes and splashes; dots very minute, numerous; cavity regular, acute, trace of russet; stem medium; basin narrow, smooth, or minutely wrinkled, rather shallow; calyx closed; segments divergent. . . ." (Hansen.)

FLESH: yellow; texture fine, crisp, tender, juicy; flavor sprightly subacid, agreeably aromatic.

QUALITY: dessert very good; cooking very good.

COMMERCIAL VALUE: third class.

SEASON: September to November.

PRIMATE.

A fine dessert apple for the home garden; too tender for distant shipment.

ORIGIN: Camillus, New York State, 1840, where a bronze tablet marks the spot where stood the original tree.

TREE: tender, not long lived, somewhat subject to canker; vigorous; productive; ripens its fruit irregularly.

FRUIT: above medium, but not uniform; form oblate conical; skin light yellow, with crimson blush on sunny side; stem about an inch long inserted in a large deep furrowed cavity; calyx closed in an abrupt, moderately deep, somewhat corrugated basin.

FLESH: color white; texture tender, juicy; flavor very pleasant subacid.

QUALITY: dessert very good to best; cooking fair.

COMMERCIAL VALUE: third class.

SEASON: August, September.

QUEEN OF THE PIPPINS.

An old English apple, counted a second rate dessert apple in England which Dr. Hogg speaks of as "shrinking before Christmas." Thos. Sharpe, however, has tested this apple, among many others, at the Dominion Experimental Farm at Agassiz B.C., and thinks it worthy of a place in the list for that province. We quote his description as given in his report for 1909:

TREE: a strong upright grower and a regular producer of heavy crops.

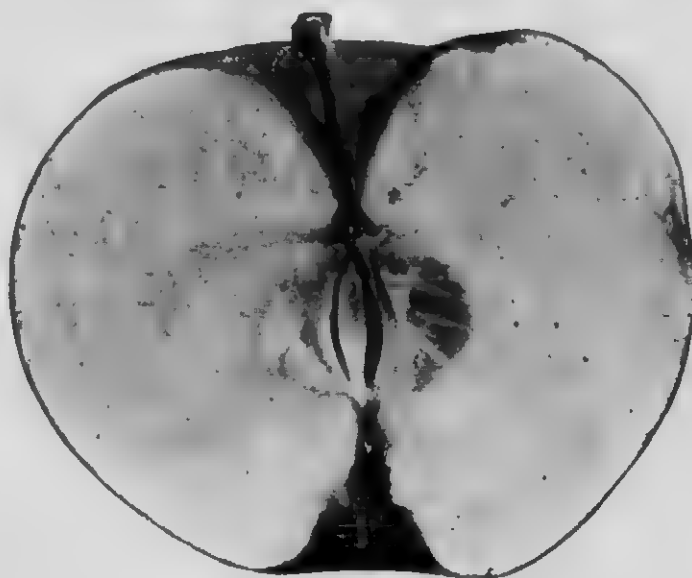
FRUIT: medium size or above and fairly uniform; skin bright yellow, splashed with bright red.

FLESH: yellowish white, firm, crisp, aromatic, mildly acid.

SEASON: (British Columbia): November to February.



PRIMATE.



SECTION OF PRIMATE.

RAMBO.

(Fall Romanite.)

One of the longest cultivated varieties on this continent, but declining in popularity and now very seldom planted except a tree or two in the home garden. An attractive apple when well grown, but much of the fruit runs below normal size; it is quite subject to apple scab, and ripens quickly in closed packages if weather should be hot after harvesting.

ORIGIN: Eastern Pennsylvania.

TREE: vigorous; spreading; productive.

"FRUIT: medium regular oblate, large specimens roundish oblate, and flattened at ends; surface greenish yellow with bright red stripes and splashes, coloring sometimes nearly solid on sunny side, with a rich bloom; dots many small, distinct, some large russet specks; cavity wide, deep, regular, green; stem medium to long; basin wide, shallow, abrupt, slightly corrugated; calyx small, closed. . . ." (Hansen.)

FLESH: color greenish white; texture tender, delicate, crisp, juicy, aromatic, vinous, subacid.

QUALITY: dessert very good; cooking good.

COMMERCIAL VALUE: third class.

SEASON: October and November; in cold storage till February.

RED CHEEKED PIPPIN.

(Monmouth Pippin.)

Succeeds in British Columbia.

ORIGIN: Monmouth County, N.J.

TREE: moderately vigorous; productive.

"FRUIT: large; form roundish oblate, slightly conic; color light greenish yellow with fine red cheek; dots minute, green and russet; cavity large, wide, regular or wavy, slightly russeted; stem short, thick; basin abrupt, deep, corrugated; calyx half open." (Hansen.)

FLESH: color white; texture crisp, juicy; flavor mildly subacid, rich.

SEASON (New Jersey): November to April.

RED EISER.

Commended by Thos. Sharpe, of Agassiz, for British Columbia, in report for 1909, and described as follows:

TREE: a strong grower and a fine producer.

FRUIT: above medium size, very uniform, smooth and handsome, yellow with bright red over nearly the whole surface.

FLESH: yellowish white, crisp, fine grained, juicy, mild, pleasantly acid, of good flavor.

SEASON (British Columbia): January to March.

RED REINETTE.

Commended for British Columbia by Thos. Sharpe, Agassiz, British Columbia.

TREE: strong grower, regular bearer.

FRUIT: medium size, very uniform; skin bright yellow with handsome blush in the sun.

FLESH: yellowish white, fine grained, crisp, juicy, mild, pleasantly subacid.

SEASON (British Columbia): December and January.

REPKA MALENKA.

Probably the best keeper of the Russian apples, but rather small as the name Malenka signifies.

ORIGIN: Russia.

FRUIT: below medium; conical to roundish conical, obscurely angular, somewhat irregular and unequal; skin yellow, striped, splashed, mixed and dotted dull red on sunny side; dots obscure, few, very minute, white; cavity regular, obtuse, with considerable radiating russet; stem medium to long; basin abrupt, narrow, shallow, slightly corrugated and wrinkled; calyx open or closed; segments erect, convergent, very long.

FLESH: white, firm, mildly subacid, good.

SEASON: late winter and spring; easily kept until June. (Hansen.)

RIBSTON.

A highly esteemed English apple, considerably planted in Ontario provinces to 1860, but of late not so popular in commercial orchards.

ORIGIN: near Elston Hall, Knaresborough, England.

TREE: only moderately vigorous; injures itself by overbearing; an early but irregular bearer; fairly healthy; not hardy at the north.

FRUIT: size above medium; form roundish, slightly conical; skin rough; color russet yellow with stripes of red and often a red shade on the sunny side; stem short set in a wide, often somewhat russeted cavity; calyx small, closed, in a narrow, angular, ribbed basin.

FLESH: yellow; texture crisp, firm, granular, juicy; flavor rich, aromatic subacid.

QUALITY: dessert good; cooking very good.

COMMERCIAL VALUE: first class.

SEASON: November, December; in cold storage to February.

ROMAN STEM.

One of the hardiest old eastern varieties for central and northern Iowa; the size and color are against it for market.

FRUIT: medium or below; roundish, often irregular and unequal; surface smooth, rich yellow, with faint bronze blush, sometimes with patches of russet and a few reddish specks; dots distinct, many, russet or green, size variable mostly small; cavity wide, shallow, obtuse, usually with a large lip or fleshy protuberance against the stem—this is typical of the variety, although occasionally absent; stem short; basin narrow, abrupt, wavy, somewhat corrugated; calyx closed; segments erect, convergent.

FLESH: yellow, with yellow veinings; tender, juicy, spicy, rich, subacid; excellent.

SEASON: November to March. (Hansen.)

ROME BEAUTY.

ORIGINATED in southern Ohio.

TREE: moderate grower, round headed, very productive, an early bearer, blooms late. (Hansen.)

FRUIT: large, roundish very slightly conical; mostly covered with bright red, on pale yellow ground.

FLESH: tender, not fine grained, juicy, of good quality. (Thomas.)

SEASON: early winter.

ROXBURY.

A variety at one time considerably planted in the southern part of Ontario, much called for by buyers from France who ask for russet apples; not so much in demand in American markets since the advent of cold storage. It resists scab well but is much subject to codling moth and inclined to drop its fruit early.

ORIGIN: Roxbury, Massachusetts, about 1650.

TREE: a poor grower, with flat spreading head; needs good cultivation and fertility; an irregular bearer, sometimes over cropping and then resting one or two years.

FRUIT: medium to above medium; form roundish oblate, sides unequal; skin tough, green, nearly covered with russet, and having a brownish red cheek when fully exposed to the sun; stem one-half to three-quarters of an inch long, in a medium sized regular cavity; calyx closed, in a round medium sized basin.

FLESH: yellowish white; texture almost coarse grained, moderately juicy; flavor mild, subacid, pleasant.

QUALITY: dessert only fair; cooking good.

COMMERCIAL VALUE: first class.

SEASON: January to June.

RUSSELL.

(*Cole's Quince.*)

An excellent September apple, popular in Maine.

ORIGIN: farm of Captain Wm. Russell, Farmington, Maine.

TREE: spreading, hardy, an early and a regular bearer.

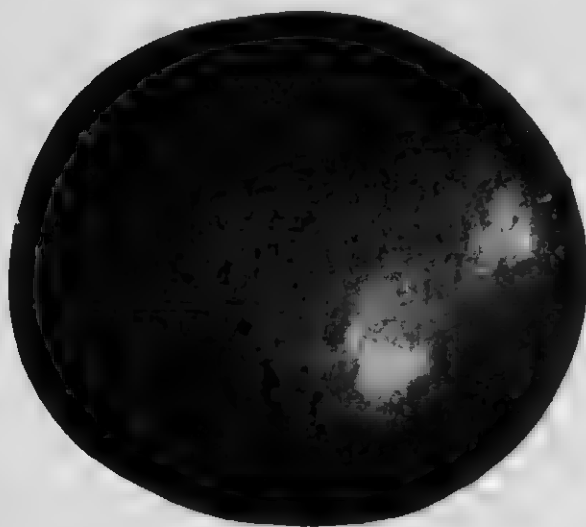
FRUIT: large, round ovate, sometimes oblong conical, somewhat flattened at the base, nearly regular; color bright yellow, with a red cheek in the sun, obscurely striped; surface waxy; stalk very short in a small narrow cavity; calyx closed, basin small, core small.

FLESH: yellow, fine grained, pleasant subacid; quality best.

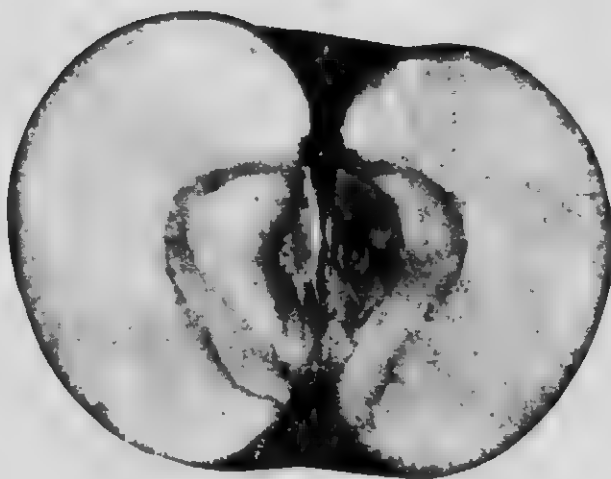
SEASON: September. (Pope.)

ST. LAWRENCE.

Valued between latitudes 45 and 46, and along valley of the St. Lawrence; but in milder parts it is now very little planted, being sometimes rather subject to scab and codling moth.



ROXBURY RUSSET.



SECTION OF ROXBURY RUSSET.

ORIGIN: Montreal, Que.

TREE: hardy, vigorous and productive.

FRUIT: large; form roundish oblate; skin, color yellowish, with distinct stripes and splashes of carmine; dots obscure; stem five-eighths of an inch long, inserted in a large, deep, regular cavity; calyx closed in a small, deep basin.

FLESH: color white slightly stained; texture crisp, tender, juicy; flavor vinous, slightly acid.

QUALITY: dessert good; cooking good.

COMMERCIAL VALUE: home market first class; foreign markets, second class.

SEASON: September and October.

SALOME.

Popular in colder sections on account of hardness of tree and beauty and shipping quality of the fruit, which is resistant of apple scab; but in the warmer sections it is not much planted because it averages rather below medium size.

ORIGIN: Ottawa, Illinois, about 1853; named by the State Horticultural Society in 1878.

TREE: vigorous, hardy, healthy, early and reliable cropper almost annually; productive.

FRUIT: medium to below medium in size, roundish conical, somewhat angular and inclined to be irregular; skin pale yellow splashed and washed with bright and sometimes rather pale red, overspread with a delicate pink bloom making the fruit very attractive looking; dots numerous, pale yellow, prominent; cavity deep and medium in width; stem short, moderately stout; basin narrow, medium in depth, almost smooth; calyx small, closed or partly open.

FLESH: yellow; texture crisp, tender and moderately juicy; flavor subacid, slightly aromatic; quality good.

SEASON: midwinter to late winter." (Macoun.)

"Its usual commercial limit is March." (Beach.)

SCARLET PIPPIN.

A fancy dessert apple which is esteemed profitable to grow for market along the River St. Lawrence.

ORIGIN: near Brockville, in Leeds County; a chance seedling.



ST. LAWRENCE.



SECTION OF ST. LAWRENCE.

TREE: upright in habit; hardy; vigorous and very productive; inclined to overbear.

FRUIT: roundish, oblate; skin waxy white, streaked; splashed or almost entirely covered with bright scarlet covering; stem stout, one-half to three-quarters of an inch long in a narrow, moderately deep cavity; calyx closed, in a narrow, very shallow basin.

FLESH: pure white; texture tender, fine, crisp, breaking, juicy; flavor subacid.

QUALITY: dessert best; cooking good.

COMMERCIAL VALUE: special market first class.

SEASON: October to February; at its best in November.

SCOTT.

(Scott's Winter.)

In the Province of Quebec this is valued as a late winter cooking apple, the tree being very hardy and the fruit a long keeper; useful for the colder districts.

ORIGIN: on the Scott farm, Newport, Vermont. Introduced by Dr. Hoskins, of Newport.

TREE: vigorous; habit upright; productive; an early bearer.

FRUIT: size small to medium; form roundish oblate, slightly conical; skin yellow, washed, striped and splashed with red; stem short, set in a regular, deep, russeted cavity; calyx closed, in a narrow, abrupt, wavy basin

FLESH: color yellow; texture fine grained, crisp, juicy; flavor pleasant, sprightly acid.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: fruit rather small to be profitable as a commercial apple, except under special conditions; second class.

SEASON: late winter.

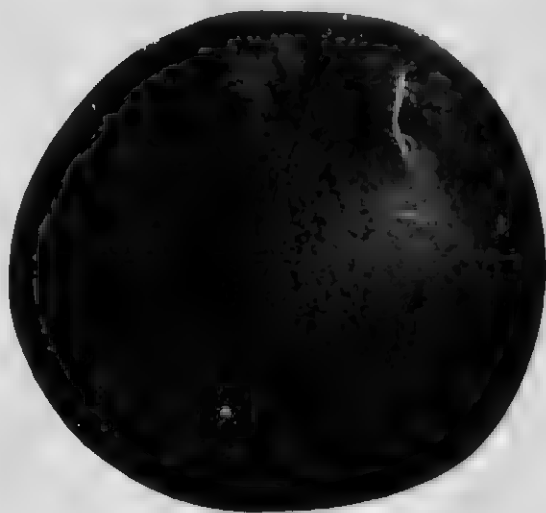
SEEK.

(Seek-no-further, Westfield.)

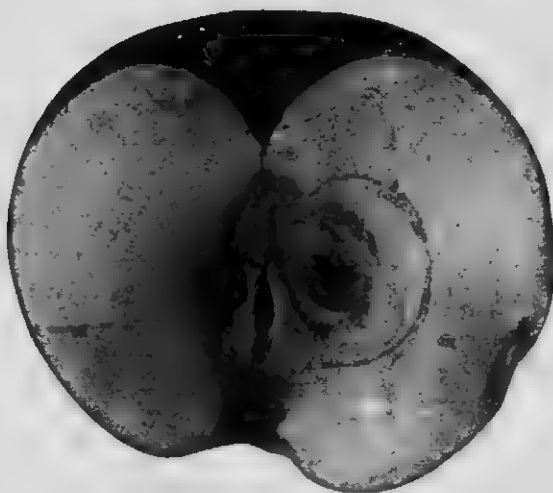
An old commercial variety, at one time considerably planted in some parts of Canada and still highly valued; but not much planted in the newer orchards.

ORIGIN: near Westfield, Conn., about 1796.

TREE: vigorous; habit spreading; productive; succeeds best on rich sandy loam.



SCOTT WINTER.



SECTION OF SCOTT WINTER.

FRUIT: size medium; form roundish conical; skin greenish yellow, shaded with dull red, striped with bright red, with russet veinings and a few, large, prominent, yellow dots, stem short, in a deep, slightly russeted cavity; calyx usually open, in a narrow, shallow, leather cracked basin; not subject to scab.

FLESH: yellowish white; texture fine grained, tender; flavor spicy, pleasant, subacid.

QUALITY: dessert very good; cooking fair.

COMMERCIAL VALUE: first class when well grown.

SEASON: October to February.

SEVERN.

A good dessert apple, and may be useful; resembles Swazie in breaking flesh.

ORIGIN: Central Experimental Farm, from seed of Swazie, and described in the Report as follows:

FRUIT: medium size; roundish, angular, flattened at ends; cavity deep, open, russeted; stem short, slender; basin deep, open, smooth; calyx closed or partly open; yellow, well washed with orange red and splashed with crimson; dots moderately numerous, yellow, prominent; skin moderately thick, tender.

FLESH: tender, breaking, moderately juicy; core small; subacid, pleasant flavor, somewhat Swazie-like.

QUALITY: good.

SEASON: October.

SHACKLEFORD.

A western United States apple.

TREE: hardy; a free grower.

FRUIT: large, roundish oblate, red.

FLESH: yellow, mild, subacid. (Thomas.)

SHIAWASSEE.

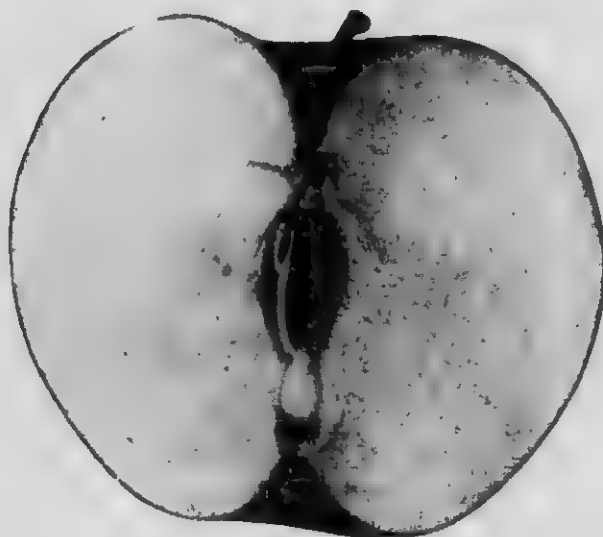
(*Shiawassee Beauty*.)

A fine variety of the Fameuse type; a fancy dessert apple and comparatively free from scab.

ORIGIN: Shiawassee County, Michigan.



SEEK-NO-FURTHER.



SECTION OF SEEK-NO-FURTHER.

TREE: hardy; vigorous; upright; productive alternate years.

FRUIT: size medium to large; form decidedly oblate; color yellowish ground, almost entirely covered with stripes, splashings, and mottlings of dark crimson and a few large, prominent, yellowish dots; stem slender, three-quarters of an inch long, in a broad deep cavity; calyx usually closed, in a large, deep basin.

FLESH: color very white; texture firm, very crisp, juicy, fine grained; flavor excellent.

QUALITY: cooking fair; dessert very good.

COMMERCIAL VALUE: promising as a first class fancy apple.

SEASON: October to January.

SILVIA.

One of Dr. Wm. Saunders' hybrid crabs; obtained by fertilizing flowers of *Pyrus baccata* with pollen of Yellow Transparent; recommended for Manitoba and Saskatchewan; described in his report as follows:

TREE: a strong grower and fair bearer.

FRUIT: size 1.4 inch across by 1.5 inch deep; form somewhat pointed and ribbed; calyx persistent; stem one-quarter to one-half of an inch long; color pale yellow.

FLESH: flavor pleasant, subacid, no astringency.

QUALITY: cooking good.

SEASON: ripe August 9 or 10; the earliest to ripen of all the cross-bred apples yet fruited.

SIMBIRSK No. 1.

FRUIT: oblate to roundish conical; large; cavity deep, narrow, russeted; stem short and stout; basin narrow to medium width, deep; calyx partly open or open; greenish yellow splashed and streaked with purplish red; dots obscure; bloom slight; skin moderately thick, moderately tender.

FLESH: yellowish, juicy, coarse; core small; flavor subacid.

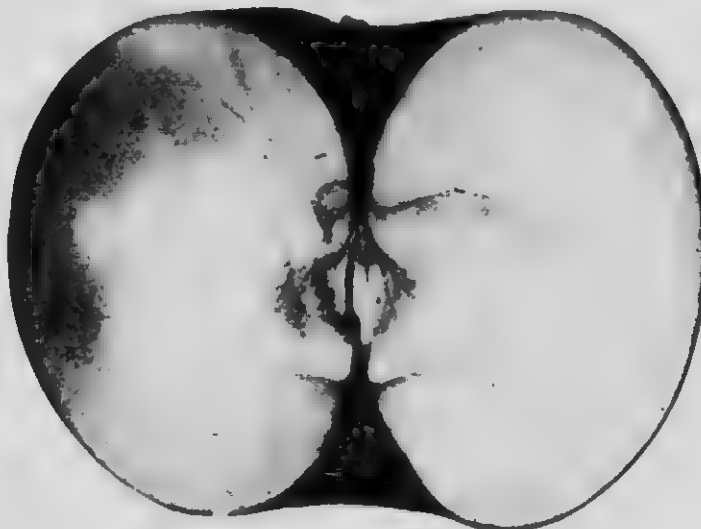
QUALITY: medium.

SEASON: late August to early September; not as good as Duchess.

Specimens from C. E. F., described by W. T. Macoun, the horticulturist.



SHIAWASSEE BEAUTY.



SECTION OF SHIAWASSEE BEAUTY.

SMOKY ARCAD.

ORIGIN: Russia.

FRUIT: small, medium, roundish oblate, greenish yellow; cavity narrow, acute; stem short; basin small, abrupt, regular.

FLESH: white, firm, sweet.

QUALITY: very good. (Thomas.)

SONORA.

A handsome apple; considered better in quality than Langford, there being no astringency; promising.

ORIGIN: Central Experimental Farm, Ottawa, from seed of Langford, and described in Report as follows:

FRUIT: medium size; roundish; cavity medium depth and width; stem medium length, slender; basin open, medium depth, nearly smooth; calyx partly open; pale yellow well washed with crimson; dots obscure; skin thin, tender.

FLESH: dull white, rather coarse, tender, moderately juicy; core large; subacid, pleasant flavor, slightly Fameuse-like.

QUALITY: good.

SEASON: probably early September.

SOREL.

A handsome apple which may prove useful; in shape much like Scott Winter, but in color like McMahon, which it resembles in flavor also.

ORIGIN: Central Experimental Farm, Ottawa, from seed of McMahon, fertilized by Scott Winter; described in Report as follows:

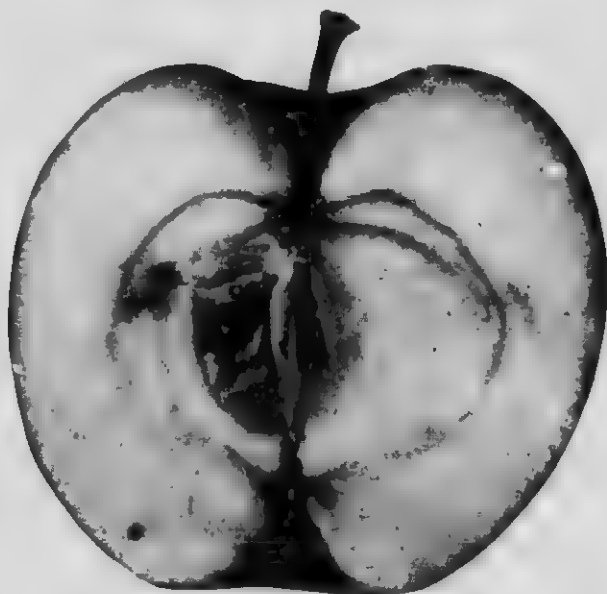
FRUIT: above medium size; oblate, conic; cavity wrinkled; calyx closed or partly open; skin pale yellow, washed on sunny side with bright attractive red; moderately thick, tender; dots obscure.

FLESH: white with a yellowish tinge, crisp, moderately juicy; core medium; flavor subacid, pleasant; quality above medium.

SEASON: from December through the winter.



SPITZENBURG.



SECTION OF SPITZENBURG.

SPITZENBURG.*(Esopus Spitzenburg.)*

A favorite dessert apple for late winter use, and widely planted by early settlers in Canada. It has proved unprofitable as a commercial apple because the tree is a weak grower, and yields small crops: succeeds in some parts of British Columbia.

ORIGIN: Esopus, on the Hudson River, previous to 1798.

TREE: lacking in vigor, often showing dead or feeble wood; upright, spreading, with drooping limbs when in bearing; fairly hardy.

FRUIT: size medium to large, oblong, slightly conical; skin straw color in shade, but usually nearly covered with bright red, and dark red in sun, with a few stripes, and many obscure gray dots; stalk seven-eighths of an inch long in a narrow deep cavity; calyx nearly closed, set in a narrow basin of medium depth, slightly corrugated.

FLESH: yellowish white; texture crisp, juicy, breaking; flavor brisk, rich, delicious.

QUALITY: first class for all purposes.

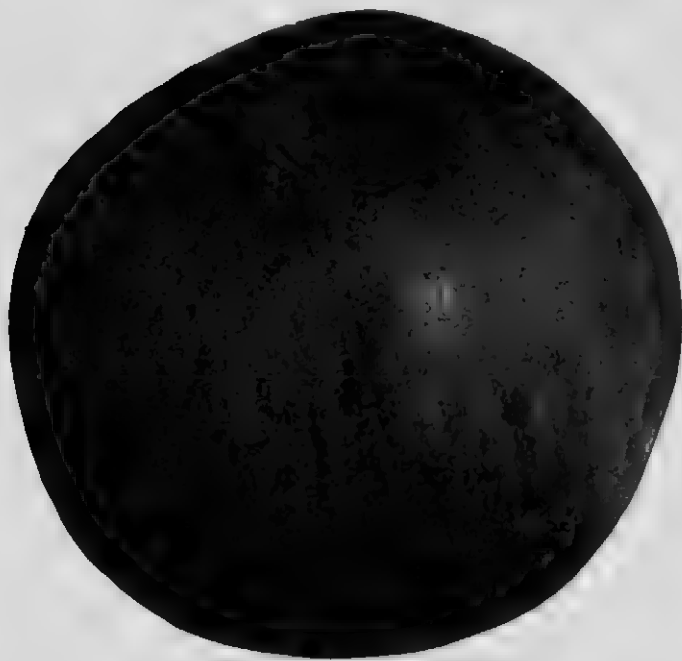
SEASON: November to February.

SPY.*(Northern Spy.)*

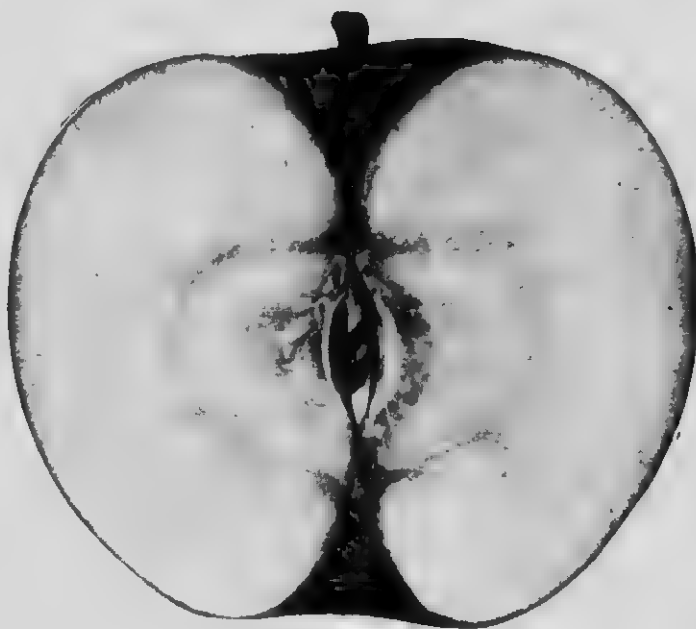
The Spy stands in the very first rank of Canadian apples in either home or foreign markets. In the southern parts of the Province of Ontario it attains great perfection. Its beauty of coloring, half-shaded by its delicate bloom, and its great excellence of quality combine to make it worthy of its wide popularity. In Chicago and in our own Northwest, Canadian Spys are more sought for than any other variety, but owing to tenderness of skin, which shows the slightest bruise, it is less popular for export to Great Britain than some other varieties. The tree is late in coming into bearing, often being ten or fifteen years planted before yielding a crop, and this renders the variety somewhat unpopular with planters. Probably for fancy packages, selected Spys would be among the best of apples.

ORIGIN: near Rochester, N.Y., introduced about 1850.

TREE: upright and spreading in habit; fruit spurs on interior boughs very vigorous; late in coming into bearing, but after-



SPY.



SECTION OF SPY.

wards very productive in alternate years; blossoms late in spring and holds its fruit late in autumn; requires high cultivation and good fertility.

FRUIT: large to very large; form roundish, slightly conical; skin thin, light green, or pale yellow, sprinkled with light pink, striped and shaded with pinkish red, and covered with thin whitish bloom; stalk slender, three-quarters of an inch long, in a wide, deep, sometimes russeted, cavity; calyx small, closed, in a narrow, moderately deep, abrupt, irregular basin.

FLESH: white; texture fine grained, crisp, tender, juicy; flavor rich, sprightly subacid, fragrant.

QUALITY: dessert and cooking best.

VALUE: home market first class; skin a little tender for distant shipment unless handled with care and wrapped with paper.

SEASON: January to May.

STARK.

A good winter export apple; its dull red color is perhaps its chief drawback.

ORIGIN: Ohio.

TREE: a stout vigorous grower; very productive each alternate year; foliage large dark green, somewhat subject to fungus.

FRUIT: large; form roundish, slightly one-sided, somewhat oblong conical; skin covered with shades and splashes of light and dark red on a greenish yellow ground, thickly sprinkled with brown dots; stalk one-half of an inch long, stout, in a small cavity of medium depth; calyx large, half closed, in a large, shallow, plaited basin.

FLESH: yellowish white; texture a little coarse, firm and moderately juicy; flavor mild, subacid, good.

QUALITY: dessert poor; cooking good.

COMMERCIAL VALUE: first to second class.

SEASON: January to May.

STAYMAN WINESAP.

A seedling of Winesap.

ORIGINATED by Dr. Stayman, of Kansas; described by him as follows:

TREE: resembles that of Winesap; very vigorous; an early and abundant bearer.



STARK.



SECTION OF STARK.

FRUIT: medium to large, heavy, oblate conical, regular, greenish yellow, mostly covered and indistinctly splashed, mixed and striped with dark dull red; dots medium, numerous, distinct, gray; stem medium length, slender; cavity wide, deep, much russeted, extending, regular; calyx large, open or half open, erect, large; basin rather narrow, abrupt, deep furrowed.

FLESH: yellow, firm, tender, juicy, rich, mild subacid, aromatic.

QUALITY: best.

SEASON: January to May.

STONE.

ORIGINATED in Vermont, and introduced by a Mr. Stone in 1836.

FRUIT: large to very large; form roundish, irregular, angular; cavity narrow, sometimes closed, shallow; stem short, slender; basin narrow, shallow, slightly wrinkled; calyx partly open; color yellowish green, splashed and washed with dull, deep, purplish red; dots moderately numerous, gray, distinct; skin thick, tough.

FLESH: yellowish, crisp, tender, juicy; core small; mildly subacid, spicy, good flavor.

SEASON: midwinter to late winter.

TREE apparently very hardy.

Appearance is rather against this apple, as it is not very attractive, but it is a fair dessert apple. (Macoun.)

STUMP.

An attractive looking fall apple, sometimes shown at our Provincial Fair; considered a fairly profitable variety.

ORIGIN: United States; Thomas says in Monroe County, New York, while Downing supposes that it originated in the State of Delaware.

TREE: spreading; productive.

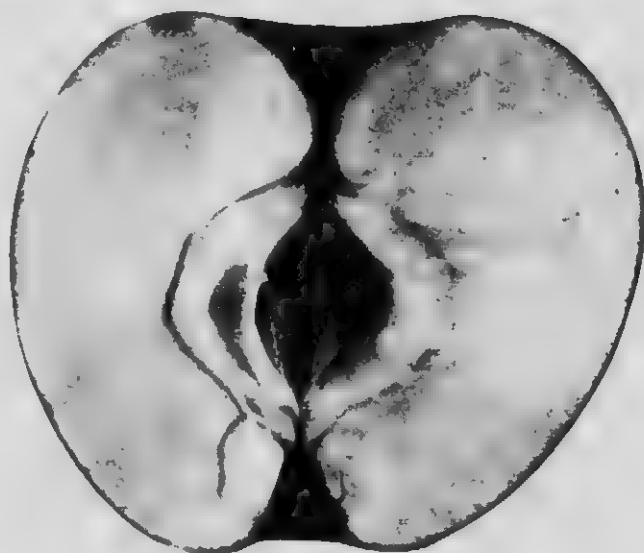
FRUIT: size medium; form oblate conical; color yellowish, splashed and blotched with bright red; stem stout, three-eighths of an inch long, in narrow, moderately deep, funnel shaped cavity; calyx half open, set in a deep wrinkled basin.

FLESH: color white; texture crisp, juicy, firm; flavor subacid.

QUALITY: fair for dessert; good for cooking.



STUMP.



SECTION OF STUMP.

VALUE: home market first class; foreign market second class.

SEASON: September and October.

SUTTON.

(*Sutton Beauty.*)

ORIGIN: Sutton, Mass.; thought to be a seedling of Hubbardston, but of more attractive appearance.

TREE: upright, thrifty; very productive.

FRUIT: above medium to large; form roundish oblate, conical; surface smooth, waxen yellow, mottled, washed and shaded crimson, with obscure carmine splashes and stripes; dots few, large, whitish, and russet, distinct; cavity deep, wide, with greenish russet; stem rather short; basin shallow, abrupt, slightly wrinkled; calyx half open; segments divergent.

FLESH: whitish, crisp, tender, juicy; flavor sprightly subacid; good to very good.

SEASON: midwinter. (Hansen.)

SWAAR.

An old winter apple, which has lost favor with planters in Canada, because of its unattractive exterior.

ORIGINATED by the Dutch settlers on the Hudson River, near Esopus, N.Y.; the name in low Dutch means heavy, alluding to its unusual weight; a deep, rich sandy loam is required for its best development.

TREE: vigorous; spreading; productive.

FRUIT: medium to large; form roundish to roundish oblate, mostly regular, often obscurely angular; surface roughened by dots and sometimes with gray russet net-veining, greenish yellow, with bronze or red blush, at full maturity a fine dead golden yellow; dots many, very large, conspicuous, light russet; cavity regular, narrow, often russeted, sometimes nearly closed; stem long, slender; basin almost flat, smooth or faintly wrinkled; calyx open.

FLESH: yellowish; texture very heavy, fine grained; flavor very rich, aromatic, very mild subacid, and spicy fragrance; very good to best. (Hansen.)

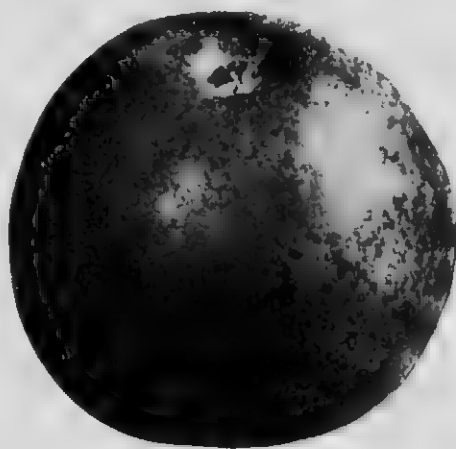
COMMERCIAL VALUE: second class.

SEASON: December to March.

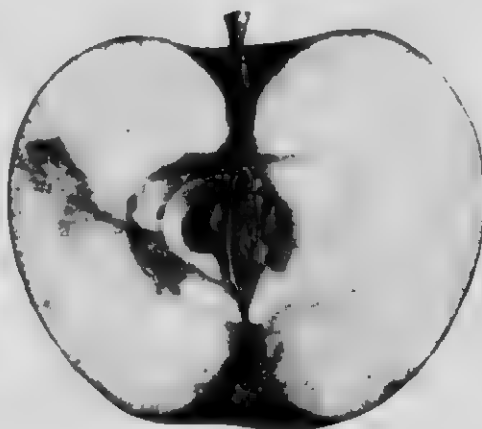
SWAYZIE.

(*Swazie Pomme Grise, Pomme Grise d'Or.*)

There is no choicer winter dessert apple for the months of December and January than the Swazie Pomme Grise, especially when kept in a cool, dark cellar, so that its crisp texture and excellent flavor may be preserved. Unfortunately, it is not very productive, and, consequently, not profitable. One large tree in the Woolverton orchards, Grimsby, Ontario, seventy-five years planted, yielded only an average of four barrels each alternate year. It is well worthy of a place in the amateur collection.



SWAYZIE.



SECTION OF SWAYZIE.

ORIGIN: probably with Col. Swayzie, near Niagara.

TREE: upright, fairly vigorous and not very productive.

FRUIT: small, round, oblate conical; color deep yellow, well colored with cinnamon russet and many whitish dots; stem three-quarters of an inch long, set in a deep cavity; calyx closed in a moderately deep, slightly corrugated basin.

FLESH: white, texture fine grained, tender, crisp, juicy; flavor aromatic, mild subacid, pleasant.

QUALITY: dessert first class; cooking third class.

VALUE: for home market second class; for foreign market second class.

SEASON: December to March.

ADAPTATION: succeeds in best apple districts.

SWEET PEPKA.

ORIGIN: Russia.

FRUIT: small, oblong conic, angular; yellowish white; cavity regular, narrow; stem short; basin wide, shallow, wrinkled.

FLESH: white, juicy, fine grained, sweet.

QUALITY: very good.

SEASON: autumn. (Thomas.)

SWITZER.

A hardy Russian apple, little grown in Canada; described by Hansen as follows:

FRUIT: medium, oblate, regular; surface light yellow, almost or wholly covered with bright crimson; dots white, few, obscure; cavity regular, russeted; stem long; basin wide, shallow, nearly flat, corrugated; calyx closed.

FLESH: snow-white, firm, fine grained, rich, spicy, mild, subacid with sweet after taste, very good.

SEASON: September, October.

TETOFISKY.

ORIGIN: Russia.

TREE: hardy, very upright; an early and annual bearer.

FRUIT: size medium or below; form oblate to roundish oblate, somewhat conical, angular; skin smooth, yellow, striped and splashed with bright crimson, marbled and mixed on sunny side, overlaid with heavy whitish bloom, a handsome fruit; cavity wide, obtuse, regular; stem short to medium; basin shallow, much corrugated and ribbed; calyx closed, segments large.

FLESH: white, juicy, sprightly acid, good.

SEASON: August. (Hansen.)

THURSO.

A very promising apple, looking, smelling and tasting somewhat like Spy.

ORIGIN: Central Experimental Farm, Ottawa, from seed of Northern Spy.

FRUIT: above medium size; roundish, angular; cavity medium depth and width; stem medium length, slender; basin

medium depth and width, wrinkled; calyx closed; pale, greenish yellow, washed and splashed with red; dots few, small, pale, indistinct; skin moderately thick, moderately tough.

FLESH: yellowish, firm, crisp, juicy; core large, open; sub-acid, sprightly, pleasant flavor.

QUALITY: good.

SEASON: probably late September and October or later. (C. E. F. Report.)

TITOVKA.

(*Titus Apple, Gipsy Girl.*)

A favorite market apple in middle Russia and found to endure severe winters; as tested at Grimsby by the writer it is inclined to drop its fruit about the middle of August and almost before fully colored; an attractive looking apple, but not of high quality.

ORIGIN: Russia.

TREE: hardy; productive.

FRUIT: large; form oblong to roundish, often flattened at base and apex, some irregular on sides; color yellowish green, almost covered with stripes and shadings of bright red and light green dots; cavity narrow, deep, irregular; stem about three-quarters of an inch long, stout; basin large, deep, plaited at bottom; calyx nearly closed, segments recurved.

FLESH: white; texture firm, coarse, moderately juicy; flavor brisk, tart.

QUALITY: dessert poor; cooking good.

COMMERCIAL VALUE: first class for near markets.

SEASON: August and September.

TOLMAN.

(*Tolman Sweet.*)

The best winter sweet apple; valuable for baking and esteemed by some people a good dessert apple; useful also as food for stock in place of roots; not of much value for export.

ORIGIN: Rhode Island.

TREE: vigorous grower; very productive; hardy; valuable as a stock upon which to top graft other and more tender

varieties such as King which is more productive, and Spy which may be grown farther north, when top grafted upon Tolman than when upon ordinary stock.

FRUIT: size medium; form roundish; color light yellow, sometimes with reddish cheek and a line from stem to calyx; stalk one-half of an inch long, often inclined, inserted in a wide, shallow, cavity; calyx closed, in a small shallow basin.

FLESH: color white; texture firm, fine grained; flavor sweet, rich.

QUALITY: dessert good; cooking fair.

COMMERCIAL VALUE: second class, except in special markets and in limited quantities.

SEASON: November to April.



TRANSCENDENT.

SECTION OF TRANSCENDENT.

TRANSCENDENT.

An excellent hybrid crab.

ORIGIN: United States.

TREE: of moderate slender growth; hardy; somewhat subject to twig blight; productive for a crab.

FRUIT: medium for its class; form roundish oblong, flattened at ends, ribbed; skin golden yellow, with crimson cheek

and thin whitish bloom; stem one and one-quarter inch long, set in an open, deep cavity; calyx closed, segments large, set in a hollow, slightly corrugated basin; somewhat subject to scab.

FLESH: color yellowish; texture crisp and moderately firm; flavor acid, slightly astringent, becoming pleasant when fully ripe.

COMMERCIAL VALUE: third class except in special markets.

SEASON: August and September.

TRENTON.

ORIGIN: seed of Golden Russet by Spy, raised by Mr. F. C. Dempsey, Albury, Prince Edward County.

TREE: vigorous; spreading.

FRUIT: size medium; color red on yellow ground, with numerous splashes and stripes of dark red and many white dots; form round oblate; stem five-eighths of an inch long in a deep cavity; calyx partly open, in a deep basin.

FLESH: color yellow; texture tender, crisp, juicy; flavor pleasant, subacid.

QUALITY: dessert good.

VALUE: first class, though it has only been tested to a limited extent.

SEASON: September and October.

UTTER.

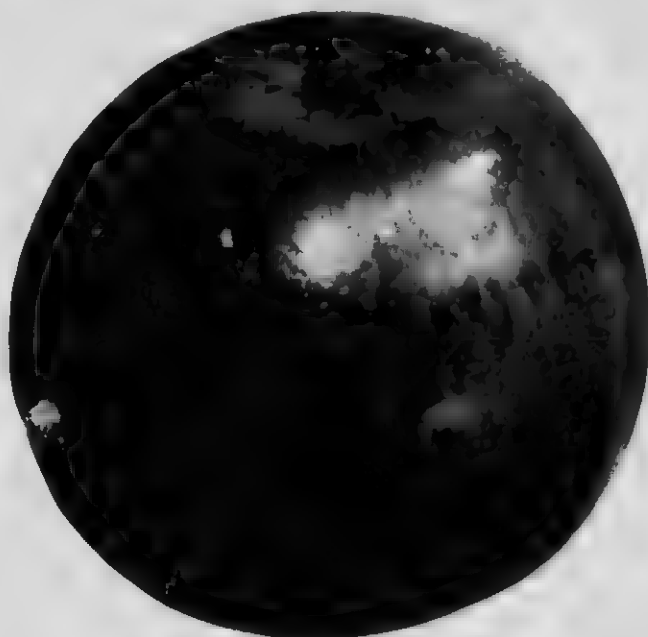
A variety much grown in Wisconsin; remarkable for variation in specimens from different parts of same tree.

ORIGIN: Wisconsin.

FRUIT: above medium to large; typical form roundish oblate (sometimes roundish, somewhat elongated, angular and flattened at ends), skin yellow, splashed, mottled, striped and much dotted with light red (from interior of tree sometimes only a clear waxen pale yellow); dots white, minute, many, a few small russet ones; cavity regular, deep, usually with trace of russet; stem medium; basin rather shallow, wavy or ribbed; calyx closed; segments very small, divergent.

FLESH: white, fine grained, tender, juicy, mild, pleasant, subacid, good.

SEASON: November, December. (Hansen.)



TRENTON.



SECTION OF TRENTON.

VANDEVERE.

An old American variety which was at one time considerably planted in Canada, but which has lost favor owing to scab, and a tendency to be undersized.

ORIGIN: Wilmington, Delaware.

FRUIT: medium; form oblate; surface waxen yellow striped with red; dots numerous, green; cavity deep; stem about one inch long; basin round, moderate; calyx small, closed.

FLESH: yellowish; texture compact, tender; flavor fine, rich subacid. (Hansen.)

QUALITY: cooking good.

COMMERCIAL VALUE: second to third class.

SEASON: October to January.

VAN WYCK.

A sweet crab.

ORIGIN: a chance seedling on the farm of Miss Van Wyck, Fishkill, N.Y.

TREE: vigorous; upright; productive.

FRUIT: large, roundish, slightly conic; surface smooth, whitish, shaded and mottled with light bright red, and covered with a thin bloom; stem rather long, slender; cavity rather narrow, deep; calyx closed; basin medium, smooth.

FLESH: whitish, fine, rather firm, moderately juicy; flavor rather rich, honeyed sweet, good. (Hansen.)

SEASON: September.

VOLGA ANIS.

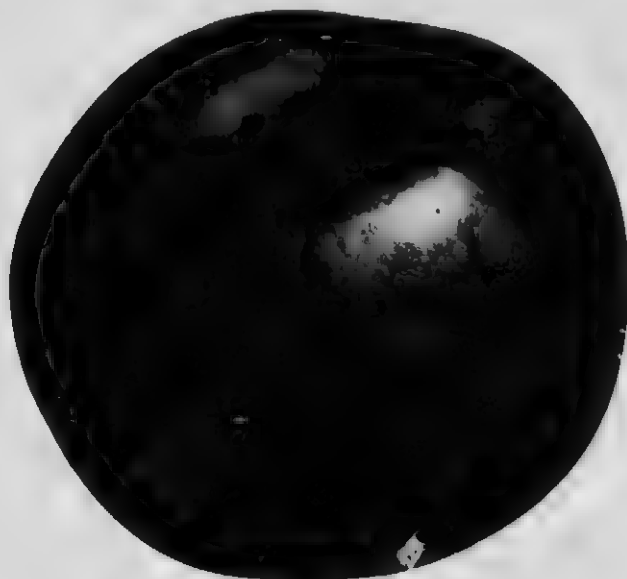
Stevenson reports this to be a hardy, thrifty round topped tree, which fruited for the first time in Manitoba in 1900.

FRUIT: below medium, color straw yellow, flesh white, quality good.

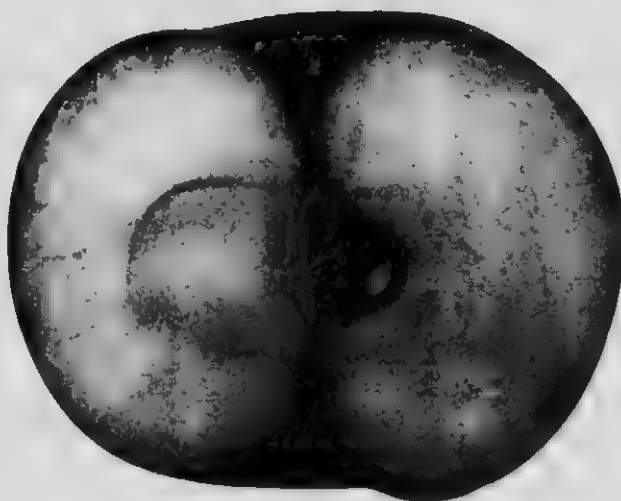
SEASON: August.

WAGENER.

A fine dessert apple when grown and highly colored, but samples grown in the shade are inferior both in appearance and in flavor; the texture of the fruit is too tender to be planted in the commercial orchard.



WAGENER.



SECTION OF WAGENER

ORIGIN: Abram Wagener, Penn Yan, N.Y., in 1796.

TREE: a slow grower and an early bearer; not long lived; sometimes planted as a "filler" in young orchards, the tree being of small growth.

FRUIT: medium to large, form oblate; color yellow, nearly covered with crimson, obscurely striped, with a few light dots; stem about seven-eighths of an inch long, inserted in a broad, deep, irregular cavity; calyx closed, set in a funnel form, somewhat corrugated basin.

FLESH: yellowish; texture fine grained, very tender, juicy; flavor subacid, very agreeable.

QUALITY: dessert very good; cooking good.

VALUE: home market first class; foreign market second class.

SEASON: November to February.

WALBRIDGE.

(*Edgar Red Streak.*)

A good winter apple for the colder sections on account of the hardness of the tree, but not recommended for the apple orchards of the more favored districts.

ORIGIN: Edgar County, Illinois, and first known as Edgar Red Streak.

TREE: vigorous; habit spreading; a tardy and often a shy bearer; holds its fruit well.

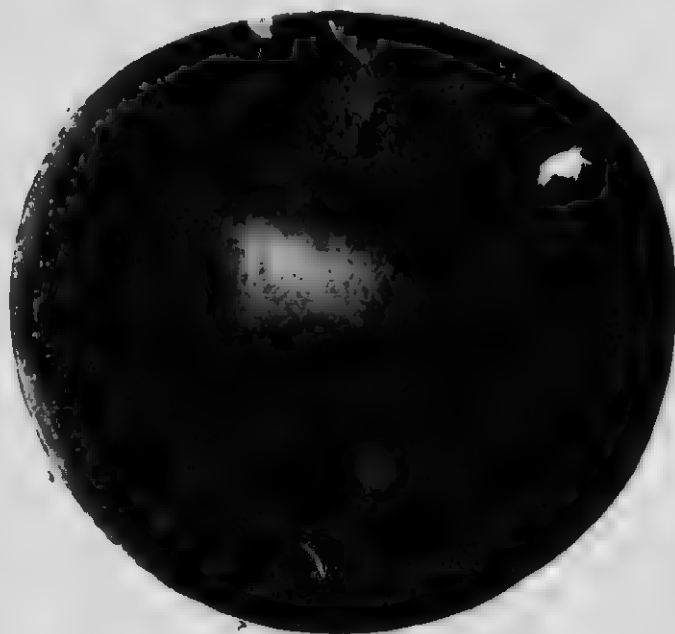
FRUIT: size medium to small; form round conic; skin pale yellow, shaded with pale red and having stripes and splashes of bright red on the sunny side and a few obscure, whitish dots; stem short in an acute, regular cavity; calyx closed, in a narrow, flat, basin.

FLESH: color white; texture tender, juicy; flavor mild subacid.

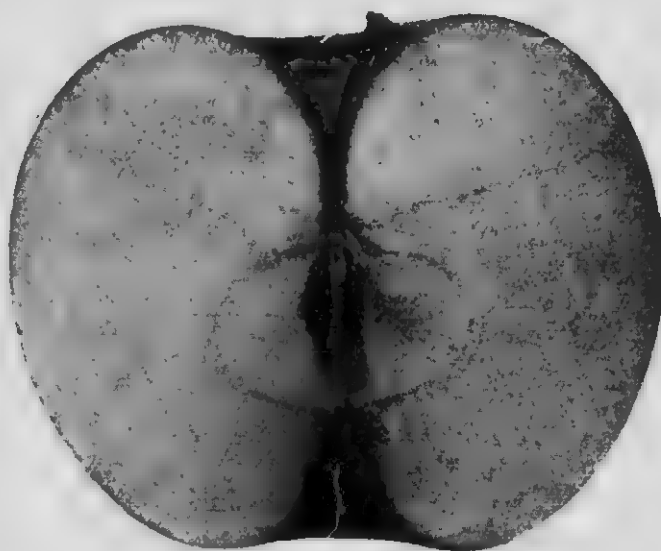
QUALITY: dessert only fair; cooking good.

COMMERCIAL VALUE: second to third class.

SEASON: November to February in ordinary storage; but in cold storage to April or May.



WEALTHY.



SECTION OF WEALTHY.

WALTER.

ORIGINATED by P. C. Dempsey, Trenton, Ont.

FRUIT: roundish, rather irregular; size very large; cavity deep, medium width; stem short, moderately stout; basin deep, medium to open, almost smooth to moderately wrinkled; calyx open; color greenish yellow, splashed and streaked with red; dots few, small, white, distinct; skin moderately thick, moderately tender; flesh yellow, tender, rather coarse, juicy, melting; core small; subacid, pleasant high flavor.

QUALITY: good to very good; a suggestion of Gravenstein flavor about this apple. (Macoun.)

SEASON: October.

WEALTHY.

A beautiful late fall or early winter commercial apple which has earned a very high reputation among apple growers in the colder sections; popular also in the warmer parts, but is there inclined to drop early.

ORIGIN: St. Paul, Minnesota, by Peter Gideon, from seed of the cherry crab.

TREE: vigorous; very hardy; over productive; an early bearer; sometimes used as a "filler" in young orchards.

FRUIT: medium; form roundish, oblate, regular; skin smooth, greenish ground, changing to pale yellow, rich red cheek, with stripes and splashes of red in the sun, sometimes nearly covered with crimson; stem one-half to three-quarters of an inch long in a deep regular cavity; calyx nearly closed in a deep, abrupt basin.

FLESH: white; texture fine grained, tender, juicy; flavor sprightly, pleasant subacid.

QUALITY: dessert good; cooking good.

COMMERCIAL VALUE: first class.

SEASON: October and November; in cold storage January.

WHITNEY.*(Whitney No. 20.)*

A hybrid crab, which is one of the most popular of its class in the colder sections; trees of this variety were in bearing at Prince Albert, in Alberta, in 1894.

ORIGIN: with A. R. Whitney, Franklin Grove, Illinois; described by Warder as early as 1869.

TREE: productive; very hardy; vigorous; an early bearer.

FRUIT: medium size; uniform; form roundish conical.



WHITNEY.



SECTION OF WHITNEY.

Slightly angular; color dark red, splashed with dark crimson on a yellow ground, with obscure, small, white dots; stem slender one inch long set in a flat, wrinkled basin; calyx closed in a regular, broad, slightly russeted basin.

FLESH: color yellowish; texture tender, crisp, juicy; flavor mildly subacid.

QUALITY: cooking very good; dessert good; cider very good.

COMMERCIAL VALUE: special markets first class; otherwise second class.

SEASON: August and September.

WILLIAMS' FAVORITE.

An apple of handsome appearance, requiring good soil and cultivation.

ORIGIN: Roxbury, Mass.

FRUIT: size medium, sometimes rather large; form oblong, ovate, remotely conical, very smooth; color mostly fine dark crimson stripes; stalk three-quarters to one inch long, enlarged at insertion; cavity shallow; basin small and shallow, even or somewhat ribbed.

FLESH: yellowish white, moderately juicy, with sometimes a tinge of red near the surface; texture fine; flavor mild, agreeable.

SEASON: several weeks late in summer. (Thomas.)

WINDSOR.

(*Windsor Chief.*)

One of the hardiest of the Wisconsin winter seedlings: the fruit hangs well to the tree in high winds.

ORIGIN: Wisconsin.

TREE: very hardy, very productive; an early bearer.

FRUIT: medium; form oblate, slightly conical and angular; surface somewhat unctuous, smooth, light greenish yellow, mostly covered with mixed and marbled dull red, indistinctly splashed, rarely striped, with crimson; dots many, large, gray, coalescent, some surrounded with russet; cavity wide, obtuse, regular, russeted, sometimes rather shallow; stem medium to long, slender; basin abrupt, rather narrow, smooth; calyx closed, segments small.

FLESH: whitish yellow; texture firm, fine grained, flavor somewhat spicy, pleasant subacid; very good.

SEASON: December to spring. (Hansen.)

A promising variety for vigorous climates. (Beach.)

WINESAP.

One of the leading export apples in some of the Western States; not surpassed for commercial value by its seedlings, Stayman, Gilbert, Paragon or Arkansas, which, however, are rather more vigorous in tree.

ORIGIN: probably New Jersey; considered by Cox in 1817 one of best cider and eating apples of western New Jersey.

"TREE: tender; moderately vigorous, with rather open, straggling head; very productive and an early bearer.

"FRUIT: medium, on poor soil too small; form roundish conical, often obscurely angular and slightly ribbed; skin moderately thick, very tough; surface smooth, rich dark yellow, mostly covered with fine lively dark red, sometimes obscurely striped, often with russet net veining, especially toward the base: dots few, minute, indented toward apex, distinctly elongated toward base; cavity wide, regular, acute, lined with reddish, stellate russet, sometimes extending out a little over base; stem medium; basin narrow, shallow, plaited; calyx closed; segments flat, convergent; . . .

"FLESH: yellow; texture firm, crisp, fine grained; flavor rich, sprightly subacid; very good." (Hansen.)

COMMERCIAL VALUE: first class in certain districts, as in West Virginia; second class as grown in Canada.

SEASON: January to April.

WINTER ROSE.

ORIGINATED in Dundas County, Ontario.

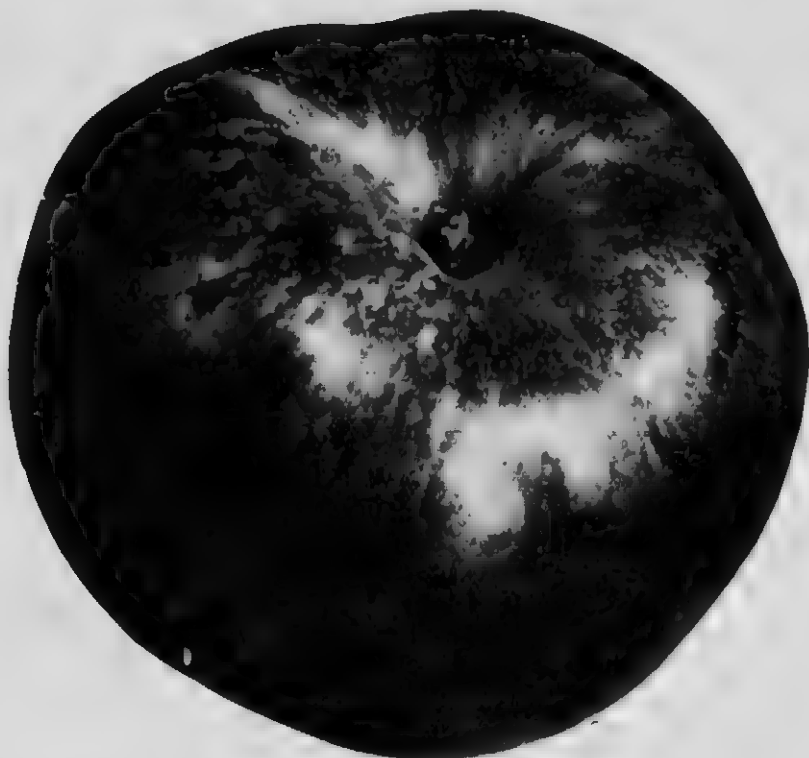
TREE: hardy; vigorous, and an early bearer; may be useful in the north.

FRUIT: oblate; size above medium; cavity medium depth, narrow, lipped toward base of stem; stem short, moderately stout; basin narrow, shallow to medium, slightly wrinkled; calyx partly open or open; color yellowish green, well washed with dull red; dots obscure; skin rather thick, tough.

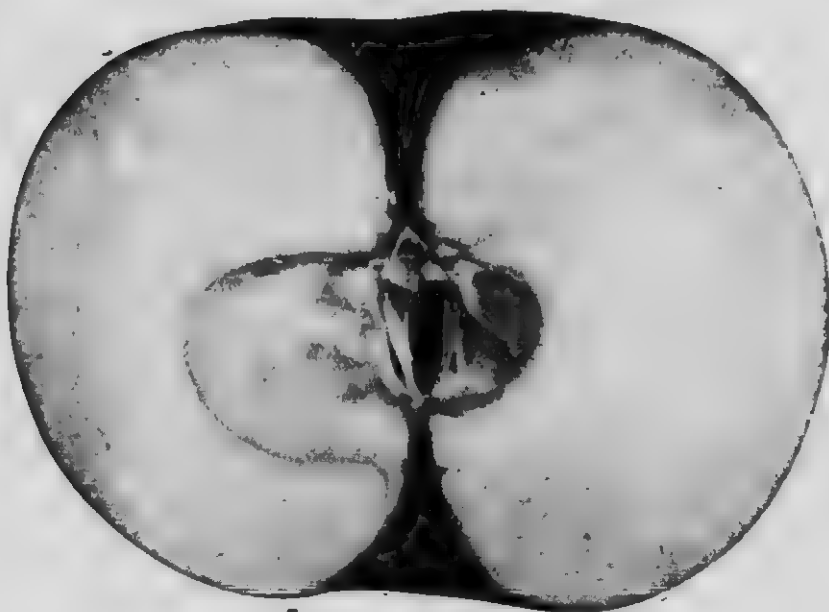
FLESH: white, tender, moderately juicy, subacid; core small.

QUALITY: above medium.

SEASON: early to midwinter. (Macoun.)



WOLF RIVER.



SECTION OF WOLF RIVER.

WINTER ST. LAWRENCE.

Imported in 1833 from Manchester, England, under the name of Mank's Codling, by the late Wm. Lunn, of Montreal; named Winter St. Lawrence by the Montreal Horticultural Society about 1873.

TREE: a moderately spreading, strong grower and apparently very hardy; a light to medium but annual bearer at Ottawa; yields well in some orchards.

FRUIT: medium to large, roundish, slightly conical; skin greenish yellow well covered with deep red, through which are dark purple splashes and streaks; dots fairly numerous, pale, distinct; cavity rather deep and medium in width; stem short, slender; basin narrow, almost smooth, of medium depth; calyx partly open, sometimes closed.

FLESH: white, rather soft, melting, moderately juicy, subacid, good flavor; core small.

QUALITY: good.

SEASON: early winter. (Macoun.)

WOLF RIVER.

A fancy apple sometimes reaching an immense size; a trifle later than Alexander with similar characteristics.

ORIGIN: a seedling of Alexander, raised on the bank of the Wolf River, in Wisconsin.

TREE: hardy; vigorous, and fairly productive; not an early bearer.

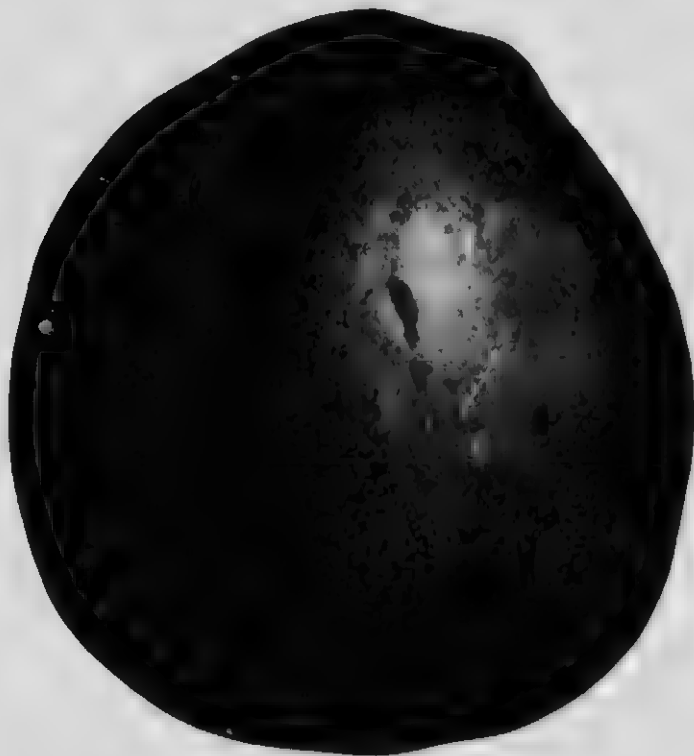
FRUIT: very large; oblate or roundish oblate, regular, firm; uniform; skin light yellow, shaded with dark red or crimson sun with a few yellowish dots; stalk three-quarters of an inch long, set in a narrow, deep basin, of a green or russet color; calyx open, in a narrow, deep, green wrinkled basin.

FLESH: yellowish white; texture moderately firm, not fine grained, juicy; flavor pleasant subacid.

QUALITY: cooking good.

COMMERCIAL VALUE: first class for near markets as a fancy apple; also in cold storage for export.

SEASON: October, November; in cold storage to January.



YELLOW BELLFLOWER.



SECTION OF YELLOW BELLFLOWER.

YELLOW BELLFLOWER.

(Bishop Pippin of Nova Scotia.)

At one time the Bellflower was planted to some extent in Ontario orchards, but the tree has proved itself irregular in its bearing habits, sometimes producing magnificent samples, and at other times small and poorly colored fruit, and the fruit is tender and shows very slight bruises, so that it is not suitable for export; it is a favorite in the Maritime Provinces for local markets.

ORIGIN: Burlington, N.J.

TREE: vigorous, forming a roundish, spreading and somewhat drooping head; productive alternate years.

FRUIT: size large; form apparently oblong, because tapering toward calyx, somewhat angular and ribbed; color pale yellow, often with a beautiful blush on the sunny side and numerous obscure whitish dots; stem slender, one inch long, in a narrow, deep cavity; calyx closed in a small corrugated basin.

FLESH: color yellow; texture tender, juicy and crisp; flavor sprightly subacid, agreeable when eaten in season.

QUALITY: dessert good; cooking good.

COMMERCIAL VALUE: home market first class.

SEASON: December to February.

YELLOW TRANSPARENT.

An apple which may prove a substitute for the well-known Early Harvest which is so subject to apple scab. This variety seems to be proof against fusieladium, both in leaf and fruit.

ORIGIN: St. Petersburg, Russia; imported by the U. S. Department of Agriculture in 1870.

TREE: hardy; vigorous; upright; an early and an annual bearer; productive.

FRUIT: above medium, roundish oblate, inclined to be conical; skin clear white, yellowish white when very mature; dots light green, obscure; stalk medium, in large cavity; calyx closed in medium, slightly corrugated basin; fruit hangs well on the tree; cuts show fruit below normal size.

FLESH: white; texture firm till very ripe, then tender.

QUALITY: second class.

SEASON: early August.



YELLOW TRANSPARENT.



SECTION OF YELLOW TRANSPARENT.

YORK IMPERIAL.

A fine export market apple, highly valued in some of the American States, but not yet much grown in Ontario.

ORIGIN: York County, Pennsylvania.

TREE: a moderate grower; productive.

FRUIT: medium in size; angular, oblique; color of skin bright red in shades, stripes and splashes on a yellowish ground; stem half an inch long in a deep funnel shaped cavity; calyx nearly closed in an irregular deep, slightly plaited basin.

FLESH: yellowish; texture firm and juicy; flavor subacid, good.

QUALITY: dessert fair; cooking good.

COMMERCIAL VALUE: first class for market.

SEASON: January to March.

ZUSOFF.

(*U. S. Department No. 585.*)

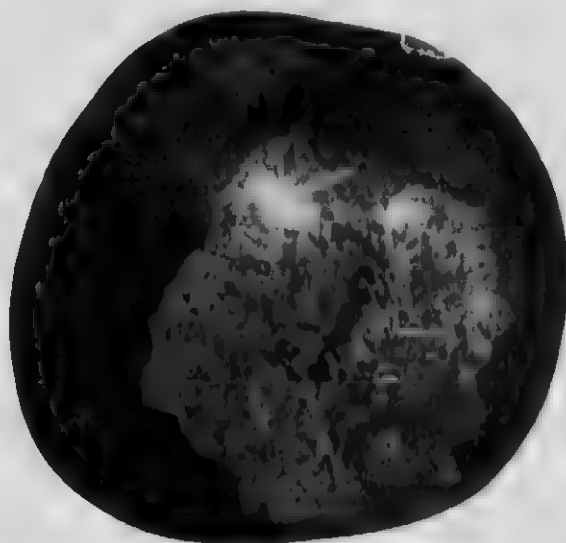
A showy fruit.

ORIGIN: Russia.

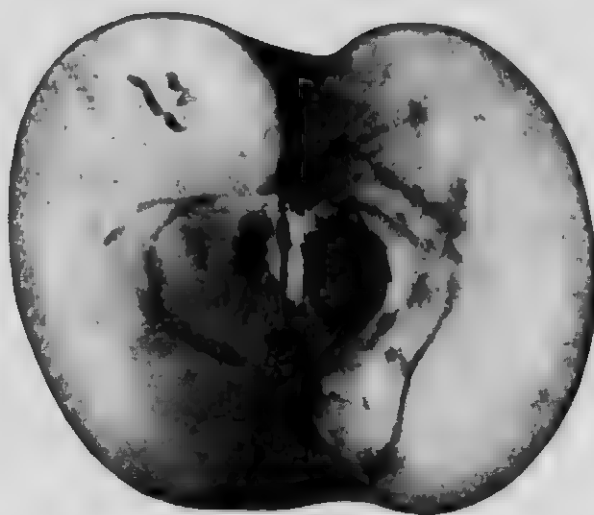
FRUIT: large, heavy, roundish oblate, regular or faintly angular; skin smooth, glossy, greenish yellow, almost or wholly covered with a peculiar dark brownish red, no stripes nor splashes; dots minute, numerous, whitish, distinct; cavity abrupt, very deep, regular, green and russet, the russet sometimes extending out in irregular rays; stem very short; basin small, regular; calyx closed; segments small, erect, convergent.

FLESH: white, with greenish tinge and veinings; texture juicy, firm, fine grained; flavor subacid, good.

SEASON: winter. (Hansen.)



YORK IMPERIAL.



SECTION OF YORK IMPERIAL.

PART III.
VARIETIES OF APPLES RECOMMENDED
FOR PLANTING IN THE VARIOUS
APPLE DISTRICTS OF
THE DOMINION,

**Compiled from Notes of Personal Visits, Correspondence, Reports of Fruit
Stations, Experimental Farms and Departments of Agriculture**

PART III.
VARIETIES OF APPLES RECOMMENDED
FOR PLANTING IN THE VARIOUS
APPLE DISTRICTS OF
THE DOMINION.

ONTARIO.

The varieties of apples desirable for planting in the various apple sections of the Province of Ontario have been made a special study by the writer for many years past, in his official capacity in connection with the Ontario Fruit Growers' Association and the Ontario Fruit Experiment Station. He is able, therefore, to present the following lists, prepared under the approval of these societies, with considerable confidence as including the kinds most worthy of consideration by intending planters. The lists recommended for the other provinces are given by the authority of officials similarly qualified to speak concerning them.

The term "Commercial" is here used to include those varieties most desirable for market purposes, and the term "Domestic" those most desirable for home uses, either for cooking or dessert.

COMMERCIAL.

Summer.

ASTRACAN: adapted to all sections except the extreme north.

DUCHESS: adapted to all sections.

Fall.

GRAVENSTEIN: adapted to all sections except the St. Lawrence River and other northerly portions of the Province.

WEALTHY: particularly valuable for northern sections.

ALEXANDER: especially for northern districts.

McINTOSH: adapted especially to the St. Lawrence River district, but can be grown over a much wider area.

FAMEUSE: adapted especially to the St. Lawrence River district, but succeeds well over a much wider area.

BLLENHEIM: adapted to all sections except the St. Lawrence River district and other northerly portions of the Province.

Winter.

KING: adapted only to the best apple sections, and succeeds best when top grafted on hardy stocks.

HUBBARDSTON: adapted to the best apple sections.

GREENING: adapted to the best apple sections.

BALDWIN: succeeds best on clay land, and is adapted to the best apple districts.

NORTHERN SPY: adapted to the best apple districts, but can be grown with success farther north by top-grafting on hardy stocks. This is also a good method of bringing it into early bearing.

ONTARIO: an early and abundant bearer, but short lived. Recommended as a filler among long-lived trees. Adapted to same districts as Northern Spy, which it somewhat resembles.

STARK: adapted to best apple districts.

DOMESTIC.

Summer.

TRANSPARENT: adapted to all sections.

PRIMATE: adapted to best apple sections.

BOUGH: adapted to best apple sections.

DUCHESS: adapted to all sections.

Fall.

CHENANGO: adapted to best apple sections.

GRAVENSTEIN: adapted to best apple sections.

WEALTHY: especially adapted to northern sections.

MCINTOSH: especially adapted to northern sections.

FAMEUSE: especially adapted to northern sections.

BLLENHEIM: adapted to best apple sections.

Winter.

KING: adapted to best apple sections. Should be top grafted.

WAGENER: adapted to best apple sections.

SWAYZIE: adapted to all sections except most northerly.

GREENING: adapted to best apple districts.

TOLMAN: adapted to best apple districts.

NORTHERN SPY: adapted to best apple districts, but will succeed farther north if top grafted

MANN: adapted to best apple districts, but will succeed farther north if top grafted.

HARDY VARIETIES

For sections north of 46 degrees.

Summer.

Yellow Transparent, Charlantoff.

Fall and Winter.

Duchess, Wealthy, Hibernial, Longfield, Patten, Whitney, Hyslop, Scott Winter.

Crabs,

Suitable for the whole of the Province.

WHITNEY: a large crab of high quality, suitable for planting in the extreme north where other apples will not succeed. May be used for dessert or cooking.

MARTHA: an early crab of fair quality.

TRANSCENDENT: yellowish crab, season early autumn.

HYSLOP: dark, rich, red crab, of late season, quality only fair.

DISTRICT LISTS.

Niagara District,

Including Niagara Peninsula from Niagara River to Hamilton.

COMMERCIAL: Astracan, Duchess, Gravenstein, Alexander, Blenheim, Hubbardston, King, Baldwin, Spy.

DOMESTIC: Early Harvest, Bough, Duchess, Chenango, Gravenstein, Shiawassee, Fall Pippin, Fameuse, Swayzie, Wagener, Yellow Bellflower, Spitzenberg, Tolman.

Bay of Quinte District,

Including the northern shore of Lake Ontario from Toronto to Kingston.

COMMERCIAL: Duchess, Gravenstein, Trenton, Alexander, Wealthy, Fameuse, McIntosh, King, Greening, Baldwin, Ontario Seek, Spy, Tolman, Ben Davis, Stark.

DOMESTIC: Benoni, Primate, Gravenstein, Fameuse, McIntosh, Grimes, Greening, Ontario, Spy, Tolman, Swayzie.

Burlington District.

The western shore of Lake Ontario between Hamilton and Toronto.

COMMERCIAL: Astracan, Duchess, Wealthy, Ribston, Blenheim, King, Greening, Baldwin, Spy.

DOMESTIC: Astracan, Bough, Gravenstein, Wagener, Seek, Golden Russet.

Lake Erie District

Including the northern shore of Lake Erie from the eastern boundary of Elgin County to the Detroit River.

COMMERCIAL: Astracan, Duchess, Alexander, Blenheim, Hubbardston, Baldwin, Stark, Spy.

DOMESTIC: Transparent, Golden Sweet, Duchess, Louise, King, Tolman, Spy.

Lake Huron District,

Including the east shore of Lake Huron from the northern boundary of Lambton County to Owen Sound.

COMMERCIAL: Duchess, McIntosh, Fameuse, Blenheim, Baldwin, Spy, Golden Russet, Ben Davis, Stark.

DOMESTIC: Astracan, Duchess, McIntosh, Fameuse, Louise, Blenheim, King, Greening, Tolman, Spy.

Georgian Bay District.

Southern shore of Georgian Bay from Owen Sound to Midland.

COMMERCIAL AND DOMESTIC: Astracan, Duchess, Alexander, Gravenstein, St. Lawrence, Wealthy, Blenheim, Greening, King, Baldwin, Spy.

Lake Simcoe District,

Including country bordering upon Lake Simcoe.

COMMERCIAL: Duchess, Peerless, Alexander, Wolf, Blenheim, Pewaukee, Stark, Baxter, Seek.

DOMESTIC: Astracan, Louise, St. Lawrence, Fameuse, McIntosh, King, Spy.

Guelph District,

Including the high inland counties of south-western Ontario, i.e., Wellington, north Waterloo, north-easterly Perth, southerly part of Grey, south-westerly part of Dufferin, and north-westerly section of Peel and Halton.

COMMERCIAL: Duchess, Alexander, Trenton, Wealthy, Fameuse, McIntosh, Salomé, Spy.

DOMESTIC: Astracan, Duchess, Wolf, Wealthy, Fameuse, McIntosh, Bellflower, Tolman.

CRAB APPLES: Whitney, Martha.

St. Lawrence District,

Including the Valley of the St. Lawrence River from Kingston to Cornwall.

COMMERCIAL: Duchess, Alexander, Wolf, Scarlet Pippin, Fameuse, McIntosh, Baxter, Milwaukee, Golden Russet.

DOMESTIC: Transparent, Brockville Beauty, Scarlet Pippin, Fameuse, McIntosh, Blue Pearmain, Golden Russet, Yellow Bellflower.

Ottawa District,

Including the Ottawa Valley south of 46 degrees.

COMMERCIAL AND DOMESTIC: Transparent, Lowland Raspberry, Duchess, St. Lawrence, Wealthy, Alexander, McIntosh, Fameuse, Wolf River, Milwaukee, Baxter, Scott.

ADDITIONAL DOMESTIC: Langford Beauty, Peach of Montreal, McMahon, Swayzie, Pewaukee, Golden Russet, Rufus.

CRABS: Whitney, Martha, Hyslop.

Algoma District,

Including the Islands Manitoulin and St. Joseph, and a limited portion of the northern and eastern shores of the Georgian Bay.

COMMERCIAL AND DOMESTIC: Transparent, Charlamoff Astracan, Duchess, Peach, St. Lawrence, Gideon, Colvert, Basil the Great, Longfield, Wealthy, Alexander, Wolf River, Walbridge.

QUEBEC.*Varieties approved by the Quebec Pomological Society.***From Three Rivers and Sorel, West and South.**

SUMMER: Yellow Transparent, Lowland Raspberry, Duchess.

AUTUMN: Langford Beauty, St. Lawrence, Wealthy, Alexander.

EARLY WINTER: Fameuse, McIntosh, Wolf River.

WINTER: Canada Red, Scott Winter, Golden Russet, Baxter, Milwaukee.

From Three Rivers to L'Islet, both included, East and South.

SUMMER: Yellow Transparent, Lowland Raspberry, Duchess.

AUTUMN: Peach, St. Lawrence, Wealthy, Alexander.

EARLY WINTER: Fameuse, McIntosh, Wolf River.

WINTER: Scott Winter, Canada Baldwin, Milwaukee, Baxter.

For the extreme North, Kamouraska and Charlevoix, East and North.

SUMMER AND EARLY AUTUMN: Yellow Transparent, Duchess, Charlamoff.

AUTUMN AND WINTER: Wealthy, Patten's Greening, Hibernial, Longfield.

CRAB: Whitney, Martha, Transcendent, Hyslop.

*Recommended by the Quebec Fruit Experiment Stations.***District from Montreal to Rimouski.**

SUMMER: Yellow Transparent, Tetofsky, Astracan.

AUTUMN: Duchess, Alexander, St. Lawrence, Peach.

EARLY WINTER: Fameuse, Wealthy, Wolf, McIntosh Red.

WINTER: Tolman, Golden Russet, Rox Russet, Scott Winter, Longfield, Winter St. Lawrence, Maiden's Blush, Hibernial, McMahon, Salomé, Milwaukee, Canada Red, Magog, Red Streak, Canada Baldwin.

Ottawa District,*Including Ottawa Valley south of latitude 46 degrees.*

COMMERCIAL AND DOMESTIC: Transparent, Lowland Raspberry, Duchess, St. Lawrence, Wealthy, Alexander, McIntosh, Fameuse, Wolf River, Milwaukee, Baxter, Scott.

ADDITIONAL DOMESTIC: Langford Beauty, Peach, McMahon, Swayzie, Pewaukee, Golden Russet, Rufus, and the Crabs Whitney, Martha and Hyslop.

NOVA SCOTIA.

Annapolis Valley.

Varieties suited to the Counties of Hants, Kings, Annapolis, and interior parts of Digby, Queens and Lunenburg; for other parts of the Province hardier varieties are required.

COMMERCIAL (in order of ripening): Gravenstein, Ribston, Blenheim, Cox's Orange, King, Fallawater, Greening, Baldwin, Stark, Golden Russet, Nonpareil (or Roxbury Russet), Ben Davis.

DOMESTIC: Crimson Beauty, Astracan, Bough, Duchess, McIntosh, Yellow Bellflower, Wagener, Pomme Grise, Ontario, Wealthy, Hubbardston.

BRITISH COLUMBIA.

Varieties recommended for different districts by the British Columbia Board of Horticulture, 1910.

Vancouver Island and other Islands.

Yellow Transparent, Duchess, Wealthy, King, Canada Reinette, Red Checked Pippin, Hyslop Crab.

Lower Mainland.

Yellow Transparent, Duchess, Wealthy, King, Spy, Jonathan, Hyslop Crab.

Upper Country.

Yellow Transparent, Duchess, Wealthy, McIntosh, Cox's Orange, Jonathan, Wagener, Rome Beauty, Spy, Newtown Pippin (Yellow), Spitzenberg, Hyslop Crab, Transcendent Crab.

NOTES.—The Gravenstein does well in the Kootenay district, but is not as a rule considered a good commercial success in other portions and should only be recommended to be adopted in districts where it has proved itself a success.

For Vancouver Island and adjacent gulf islands, Yellow Transparent, Wealthy, King and Canada Reinette are proved varieties. The Duchess does well in some localities, but is very subject to "anthracnose."

In the upper country Spitzenberg, whilst doing well in some sections, has not proved a success in others, and should only be planted where it has been proved. King is subject to water core and is not favored by many apple growers on this score.

PRINCE EDWARD ISLAND.

COMMERCIAL AND DOMESTIC: Duchess, Wealthy, Wolf River, Inkerman (a local apple), Stark.

NOTE.—Good fruit of Gravenstein, Blenheim, Ribston, King, Ben Davis, Northern Spy and Baldwin has been produced in Prince Edward Island, but these varieties are unreliable owing to tenderness of tree.

NORTH-WEST PROVINCES.

Domestic Purposes only.

SUMMER: Tetofsky, Blushed Colville, Lowland Raspberry, Duchess, Charlamoff.

AUTUMN: Whitney, Martha, Transcendent (Crabs), Dr. Saunders' Hybrid Crabs, Antonovka, Hibernial, McMahon, Longfield, Patten's Greening.

EARLY WINTER: McIntosh, Wealthy, Anisim.

WINTER: Milwaukee, Baxter, Winter Rose, Stone, Scott, Malinda.

NOTE.—The adaptability of the above varieties to the various districts of the North-West is not yet fully ascertained. In general, the summer and autumn varieties have proved themselves hardier than the winter, and Dr. Saunders' hybrid crabs the hardiest of all. These last are crosses between *Pyrus baccata* (or Siberian Crab) and some hardy varieties of *Pyrus malus* (our larger apples), such as Wealthy, Duchess, Scott Winter, Yellow Transparent, Golden Russet, and some of the other Russian apples. Some of the most desirable of these crosses are:

DR. SAUNDERS' HYBRIDS, viz.: Golden, Magnus, Gordon, Josie, Pioneer, Jewel, Silvia.

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